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ABSTRACT

This document contains vocational education program courses standards (curriculum frameworks and student performance standards) for exploratory courses, practical arts courses, and job preparatory programs offered at the secondary or postsecondary level in Florida. Each program courses standard is composed of two parts: a curriculum framework and student performance standards. The curriculum framework includes four major sections: major concepts and content, laboratory activities, special notes, and intended outcomes. Student performance standards are listed for each outcome. Program and course standards are based on competencies required for entry, advancement, and upgrading in occupations covered by courses in industrial education. Course content includes the following topics, among many others: journalism, automotive mechanics, drafting, masonry, air conditioning and heating service, air traffic control, auto body repair, barbering, barge and boat operation, cabinetmaking and millwork, commercial art, commercial photography, sheet metal work, television production, welding building construction technology, carpentry, clock and watch repair, commercial art, drafting, diesel engine mechanics, cosmetology, electronic technology, industrial machinery maintenance and repair, instrument repair, jewelry manufacturing and repair, office machine maintenance, meat cutting, multimedia technology, printing and graphic arts, plumbing, bus driver training, tile setting, upholstery and furniture refinishing, and vending and recreational machine repair. (KC)

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VOCATIONAL EDUCATION
PROGRAM COURSE STANDARDS

INDUSTRIAL EDUCATION

July, 1993

FLORIDA DEPARTMENT OF EDUCATION
Division of Vocational, Adult and Community Education
Bureau of Vocational Program and Staff Development
Program Development and Technical Assistance Section
Tallahassee, Florida 32399

(904) 488-1147

FOREWORD

NOTE: In all postsecondary adult vocational (PSAV) level programs, Section III, Curriculum Frameworks--regarding minimum basic skills grade level-- the correct statute reference should be 239.213 F.S. NOT 233.0695 F.S.

Section 228.041 Florida Statutes defines vocational education as meaning that instruction not necessarily leading to a baccalaureate degree, either graded or ungraded, listed below:

1. Job preparatory programs designed to provide students with the competencies necessary for effective entry into an occupation;

2. Exploratory courses designed to give students initial exposure to skills and attitudes associated with a broad range of occupations in order to assist them in making informed decisions regarding their future academic and occupational goals;

3. Supplemental programs (courses) designed to enable persons who are or have been employed in a specific occupation to upgrade their competencies in order to re-enter or maintain stability or advance within their occupation;

4. Practical arts courses designed to teach students practical generic skills which, though applicable to some occupations, are not designed to prepare students for entry into a specific occupation;

5. Instruction which integrates the basic academic skills and vocational skills.

This document contains vocational education program courses standards (curriculum frameworks and student performance standards) for exploratory courses, practical arts courses and job preparatory programs offered at the secondary or postsecondary level as a part of Florida's comprehensive vocational education program. Vocational education program courses standards are established pursuant to Section 239.205, Section 233.011, and Section 232.2454, Florida Statutes, for school districts and community colleges. State Board of Education Rule 6A-6.0571, Criteria for Qualification for Special Vocational-Technical Education Program Courses, provides the basis for the development and dissemination of this document.

Each program courses standard is composed of two parts: a curriculum framework and student performance standards. The curriculum framework includes four major sections: major concepts/content, laboratory activities, special notes, and intended outcomes. Student performance standards are listed for each intended outcome.

The standards do not prescribe how instruction should be delivered since decisions relative to the delivery of instruction must be made by school districts and community colleges within the context of local conditions. The Division of Vocational, Adult and Community Education, Florida Department of Education, supports the belief that competency-based vocational education is the most effective means of providing programs and courses that conform to these established standards.

Program and course standards are based upon competencies required for entry, advancement, and upgrading in occupations in the vocational program areas of Agriculture, Business, Diversified, Health Occupations, Home Economics, Technology, Industrial, Marketing, and Public Service Education. Standards for courses designed for handicapped, disadvantaged, and other special needs persons are also provided. The standards are reviewed annually and revised as needed based upon changes in occupations utilizing input from professional associations, state technical committees, and other representatives of the private sector.

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INTRODUCTION

INDUSTRIAL EDUCATION

Industrial Education is comprised of instructional courses, programs, services, and activities at all educational levels for selected trade and industrial occupations.

Industrial Education is a component of vocational education which prepares persons for initial employment and offers opportunities for upgrading or retraining of workers in a wide range of occupational areas. Individuals completing Industrial programs are qualified to function as skilled, semiskilled or technical workers in activities including layout, design, production, repairing products and commodities or rendering personal services. Industrial programs include classroom instruction in: technical-related theory, safety, mathematics and science, laboratory and shop tasks requiring manipulative skills, and cooperative education to provide on-the-job experiences. Instruction is provided for apprentices in apprenticeship occupations or for journeymen already employed in industrial occupations.

A recommended sequence of study covering extensive knowledge in a field of specialization is required for completion of an Industrial Education program that prepares persons to work in direct support of professional trades persons, engineers or technicians.

Vocational Industrial Clubs of America (VICA) provides additional opportunities to develop leadership, civic responsibilities, free enterprise system concepts and an understanding of the world of work in industrial occupations. Such organized activities, under appropriate supervision, are considered an integral part of the overall instructional program.

Reinforcement of basic skills in english, mathematics, and science appropriate for the job preparatory program is provided through vocational classroom instruction and applied laboratory procedures or practices.

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CURRICULUM FRAMEWORK PROGRAM AREA: INDUSTRIAL

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Academy of Journalism

CODE NUMBER: Secondary 8771100 Postsecondary _______

Florida CIP 0609.999900

SECONDARY
SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT
VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ____7-9 X 9-12 ___Postsecondary Adult Vocational

_____ Postsecondary Vocational ___ Other 30, 31

CERTIFICATION COVERAGE: JOURN 1 @ 2 @ 4 BUS ED @ 4 1 @ 2 COMM ART @ 7 G
ENG 1 @ 2 @ 4 @ 8 PHOTOGRAPH @ 7 G TV PRO TEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide a medium where by the student will be given the opportunity for practical hands-on experiences that incorporate academic skills into a real life situation.

The program familiarizes individuals with creative writing, script writing, graphic communications, desktop publishing, television production, photo- journalism, and investigative reporting.

The presentation of subject matter should incorporate team teaching. Activities should utilize a rotational type format so that the student is exposed and reinforced academically and vocationally for each outcome. Listed below are the courses that comprise this program when offered at the secondary level:

1006300	Journalism I
8771110	Industrial Communications 1
8209310	Electronic/Desktop Publishing 1

II. LABORATORY ACTIVITIES: Both classroom and laboratory activities are an integral part of this program. Classroom instruction in creative writing, script writing, and investigative reporting techniques are all meant to be reinforced with practical experiences. Putting the individuals written work into a commercially oriented product by utilizing modern multi-media technology should be the cumulative result of all outcomes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., combined with the school newspaper and yearbook activities, would be an appropriate method for providing leadership training experiences, and reinforcing specific vocational and academic skills.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Produce writings appropriate to journalistic media.
02. Organize and use production modes appropriate to journalistic media, including desktop publishing, keyboarding, photography, commercial art, and television production.
03. Plan a set for television production.
04. Perform lighting activities for a planned production.
05. Demonstrate correct use of basic equipment used in television production.
06. Demonstrate ability to identify different types of script copy.
07. Demonstrate ability to write script in broadcast style.
08. Perform electronic/desktop publishing operations.
09. Demonstrate knowledge of electronic/desktop publishing concepts.
10. Perform mechanical creative support operations.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8771100

PROGRAM TITLE: Academy of Journalism POSTSECONDARY NUMBER:

01.0 PRODUCE WRITING APPROPRIATE TO JOURNALISTIC MEDIA - The student will be able to:

01.01 Write headlines and captions for a variety of journalistic activities.
01.02 Identify the "who, what, when, where, and how" components of a news story.
01.03 Write a news story in acceptable journalistic style.
01.04 Write a sports article using news style and appropriate jargon.
01.05 Write an editorial of commendation, condemnation, or both, offering observations and/or criticisms.
01.06 Write a feature story that adheres to acceptable column style.
01.07 Describe how copyright law pertains to professional and educational use of other writers' materials.
01.08 Write copy for a variety of journalistic media (television, radio, magazines, etc.)

02.0 ORGANIZE AND UTILIZE PRODUCTION MODES APPROPRIATE TO JOURNALISTIC MEDIA. - The student will be able to:

02.01 Identify the principles of layout design.
02.02 Identify the basic elements necessary to produce a good photograph.
02.03 Describe how the use of photograph or photograph idea extends the written word.
02.04 Identify equipment appropriate for production of a variety of journalistic media.
02.05 Identify principles of advertising.
02.06 Identify proofreading symbols.

03.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

03.01 Prepare television set for a planned production.
03.02 Draw and design a set plan to scale.
03.03 Select and arrange state props.
03.04 Utilize hand tools to construct scene components.
03.05 Inspect and repair scenery as needed.

04.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

04.01 Describe types of lighting fixtures.
04.02 Identify parts of lighting fixtures.
04.03 Perform special effects lighting.
04.04 Set-up appropriate lighting for a production.
04.05 Describe functions of master lighting panel and dimmer board.
04.06 Operate master lighting panel to dimmer board.
04.07 Analyze lighting needs for production.

05.0 DEMONSTRATE CORRECT USE OF BASIC EQUIPMENT USED IN TELEVISION PRODUCTION--The student will be able to:

05.01 Load, record and play a video tape.
05.02 Demonstrate the steps necessary to set up, turn on and operate a video camera.
05.03 Demonstrate picture composition.

05.04 Identify, select and demonstrate use of an appropriate microphone.
05.05 Identify the qualities of a good audio track.
05.06 Demonstrate basic television lighting.
05.07 Explain the care, storage and use of television hardware and software.

06.0 DEMONSTRATE ABILITY TO IDENTIFY DIFFERENT TYPES OF SCRIPT COPY--The student will be able to:

06.01 Identify scripts by format.
06.02 Define terminology used in broadcast script writing.

07.0 DEMONSTRATE ABILITY TO WRITE SCRIPT IN BROADCAST STYLE--The student will be able to:

07.01 Plan and produce a storyboard.
07.02 Specify steps leading to broadcast scripts.
07.03 rite broadcast scripts.

08.0 PERFORM ELECTRONIC/DESKTOP PUBLISHING OPERATIONS--The student will be able to:

08.01 Identify machine specifications and functions.
08.02 Prepare computer printer and scanner for operations.

09.0 DEMONSTRATE KNOWLEDGE OF ELECTRONIC/DESKTOP PUBLISHING CONCEPTS--The student will be able to:

09.01 Identify the skills needed by an electronic desktop publisher.
09.02 Identify significant developments in the electronic/desktop publishing industry.
09.03 Define commonly used terms in graphic communications.
09.04 Identify characteristics of paper.
09.05 Identify software used in electronic/desktop publishing.

10.0 PERFORM MECHANICAL CREATIVE SUPPORT OPERATIONS--The student will be able to:

10.01 Identify characteristics of type, type families, type series, and type styles.
10.02 Identify elements of design.
10.03 Copy, fit, and markup (specify type sizes and styles).
10.04 Paste up mechanical elements electronically.
10.05 Check and compare completed mechanical to comprehensive layout for final proofing.
10.06 Prepare rough layout design.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Academy of Journalism — PROGRAM NUMBER: 8771100

COURSE TITLE: Journalism I — COURSE NUMBER: 1006300

COURSE DESCRIPTION:

The purpose of this course is to provide instruction in basic aspects of journalism and workshop experiences in journalistic production. The content should include, but not be limited to the following:

- recognition of and writing news for journalistic media
- development of editorials, sports articles, and feature stories
- workshop experiences in photography, layouts, advertising, printing, and other practical aspects of journalistic enterprise.

After successfully completing this course, the student will be able to:

01.0 PRODUCE WRITING APPROPRIATE TO JOURNALISTIC MEDIA - The student will be able to:

01.01 Write headlines and captions for a variety of journalistic activities.
01.02 Identify the "who, what, when, where, and how" components of a news story.
01.03 Write a news story in acceptable journalistic style.
01.04 Write a sports article using news style and appropriate jargon.
01.05 Write an editorial of commendation, condemnation, or both, offering observations and/or criticisms.
01.06 Write a feature story that adheres to acceptable column style.
01.07 Describe how copyright law pertains to professional and educational use of other writers' materials.
01.08 Write copy for a variety of journalistic media (television, radio, magazines, etc.)

02.0 ORGANIZE AND UTILIZE PRODUCTION MODES APPROPRIATE TO JOURNALISTIC MEDIA. - The student will be able to:

02.01 Identify the principles of layout design.
02.02 Identify the basic elements necessary to produce a good photograph.
02.03 Describe how the use of photograph or photograph idea extends the written word.
02.04 Identify equipment appropriate for production of a variety of journalistic media.
02.05 Identify principles of advertising.
02.06 Identify proofreading symbols.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Academy of Journalism
PROGRAM NUMBER: 8771100

COURSE TITLE: Industrial Communications
COURSE NUMBER: 8771110

03.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

03.01 Prepare television set for a planned production.
03.02 Draw and design a set plan to scale.
03.03 Select and arrange state props.
03.04 Utilize hand tools to construct scene components.
03.05 Inspect and repair scenery as needed.

04.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

04.01 Describe types of lighting fixtures.
04.02 Identify parts of lighting fixtures.
04.03 Perform special effects lighting.
04.04 Set-up appropriate lighting for a production.
04.05 Describe functions of master lighting panel and dimmer board.
04.06 Operate master lighting panel to dimmer board.
04.07 Analyze lighting needs for production.

05.0 DEMONSTRATE CORRECT USE OF BASIC EQUIPMENT USED IN TELEVISION PRODUCTION--The student will be able to:

05.01 Load, record and play a video tape.
05.02 Demonstrate the steps necessary to set up, turn on and operate a video camera.
05.03 Demonstrate picture composition.
05.04 Identify, select and demonstrate use of an appropriate microphone.
05.05 Identify the qualities of a good audio track.
05.06 Demonstrate basic television lighting.
05.07 Explain the care, storage and use of television hardware and software.

06.0 DEMONSTRATE ABILITY TO IDENTIFY DIFFERENT TYPES OF SCRIPT COPY--The student will be able to:

06.01 Identify scripts by format.
06.02 Define terminology used in broadcast script writing.

07.0 DEMONSTRATE ABILITY TO WRITE SCRIPT IN BROADCAST STYLE--The student will be able to:

07.01 Plan and produce a storyboard.
07.02 Specify steps leading to broadcast scripts.
07.03 Write broadcast scripts.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Academy of Journalism	PROGRAM NUMBER:	8771100
COURSE TITLE:	Electronic/Desktop Publishing 1	COURSE NUMBER:	8209310

COURSE DESCRIPTION:

This course is designed to develop skill in the entry-level requirements of electronic/desktop publishing and camera-ready copy. The content includes composition, copy preparation, layout design, and measurements. The use of computers is required.

08.0 PERFORM ELECTRONIC/DESKTOP PUBLISHING OPERATIONS--The student will be able to:

08.01 Identify machine specifications and functions.
08.02 Prepare computer printer and scanner for operations.

09.0 DEMONSTRATE KNOWLEDGE OF ELECTRONIC/DESKTOP PUBLISHING CONCEPTS--The student will be able to:

09.01 Identify the skills needed by an electronic desktop publisher.
09.02 Identify significant developments in the electronic/desktop publishing industry.
09.03 Define commonly used terms in graphic communications.
09.04 Identify characteristics of paper.
09.05 Identify software used in electronic/desktop publishing.

10.0 PERFORM MECHANICAL CREATIVE SUPPORT OPERATIONS--The student will be able to:

10.01 Identify characteristics of type, type families, type series, and type styles.
10.02 Identify elements of design.
10.03 Copy, fit, and markup (specify type sizes and styles).
10.04 Paste up mechanical elements electronically.
10.05 Check and compare completed mechanical to comprehensive layout for final proofing.
10.06 Prepare rough layout design.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Advanced Automotive Mechanics

CODE NUMBER: Secondary 8711000   Postsecondary _______
Florida CIP 0647.062401

SECONDARY
SCHOOL CREDITS 1   COLLEGE CREDITS___   POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational
___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AUTO MECH @ 7 G   AUTO IND @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive mechanics (85302632), automobile mechanic assistants (620.684-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: instruction in diagnosis of malfunctions in the repair of engines; fuel and electrical systems; drive train systems; transmissions and carburetors; minor engine tune up; servicing automotive components; troubleshooting skills; and basic shop management and safety skills.

The course content should also include training in communication, leadership, human relations, and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: automatic and manual transmissions; drive trains; and electrical systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Completion of the Automotive Mechanics Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollments in the core and specialization area concurrently may be necessary.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

Student performance standards required for National Institute for Automotive Service Excellence (ASE) certification are identified with the initials ASE following the standard.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in engine performance service.
02. Demonstrate proficiency in automatic transmission/trans-axle service.
03. Demonstrate proficiency in servicing manual drive trains and axles.
04. Demonstrate proficiency in engine repair service.
05. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8711000

PROGRAM TITLE: Advanced Automotive Mechanics POSTSECONDARY NUMBER:______

01.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

01.01 Analyze engine performance.
01.02 Perform running cylinder balance tests.
01.03 Perform cylinder compression tests.
01.04 Check the performance of engines equipped with on-board computers.
01.05 Inspect, remove and replace points and condensers. (ASE)
01.06 Remove and replace distributor. (ASE)
01.07 Check the distributor advance in a vehicle.
01.08 Remove distributor; inspect, test and service.
01.09 Inspect and test primary circuits.
01.10 Remove and replace coils.
01.11 Remove and replace ignition switches and resistors.
01.12 Inspect, remove and replace ignition wires, caps and rotors.
01.13 Remove, gap and replace spark plugs. (ASE)
01.14 Service electronic ignition systems.
01.15 Service air cleaners. (ASE)
01.16 Inspect, remove and replace fuel filters. (ASE)
01.17 Measure fuel flow and pressure.
01.18 Remove and replace fuel lines (ASE)
01.19 Remove and replace fuel pumps. (ASE)
01.20 Adjust idle speed.
01.21 Clean and adjust chokes. (ASE)
01.22 Inspect, remove and replace manifold control valves.
01.23 Remove and replace fuel injection system filters.
01.24 Set idle speed to specifications.
01.25 Remove and replace fuel injectors. (ASE)
01.26 Service throttle body fuel injection systems.
01.27 Service ported fuel injection systems.
01.28 Service positive crankcase ventilation (PCV) systems. (ASE)
01.29 Service evaporative control systems. (ASE)
01.30 Service thermostatic air cleaners. (ASE)
01.31 Service air-injection systems. (ASE)
01.32 Service exhaust gas recirculation (EGR) systems. (ASE)
01.33 Inspect, remove and replace catalytic converter. (ASE)
01.34 Diagnose mechanical, ignition and fuel emission problems.
01.35 Inspect, remove and replace exhaust system components. (ASE)
01.36 Inspect, remove and replace catalytic converters. (ASE)

02.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

02.01 Performance test automatic transmissions.
02.02 Change transmission oil and filter. (ASE)
02.03 Adjust linkage from the engine.
02.04 Adjust shift linkage. (ASE)
02.05 Adjust neutral safety switches.
02.06 Remove and replace external gaskets and seals.
02.07 Test vacuum shift modulator. (ASE)
02.08 Adjust bands. (ASE)
02.09 Pressure flush transmission cooler assemblies.

03.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The

student will be able to:

03.01 Diagnose drive line problems.
03.02 Diagnose and performance test manual transmission problems.
03.03 Inspect drive shafts, universal joints and center bearings.
03.04 Lubricate universal joints. (ASE)
03.05 Remove and replace transmission mounts. (ASE)
03.06 Remove and replace transmissions.
03.07 Adjust shift linkage. (ASE)
03.08 Adjust clutches. (ASE)
03.09 Remove and replace extension housing seals and bushings. (ASE)
03.10 Remove and replace clutches, release bearings, linkage and pilot bearings.
03.11 Rebuild or replace clutch master and slave cylinders. (ASE)
03.12 Remove and replace universal joints. (ASE)
03.13 Remove and replace speedometer gears and service speedometer cables. (ASE)
03.14 Remove and replace drive axle bearings and seals. (ASE)
03.15 Service and repair differentials. (ASE)
03.16 Remove and replace trans-axle assemblies.
03.17 Adjust trans-axle shifting controls.
03.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
03.19 Inspect, remove and replace constant-velocity universal joints.

04.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

04.01 Clean engines. (ASE)
04.02 Remove and replace motor mounts.
04.03 Check valve guides for wear.
04.04 Reface valves and seats.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

05.01 Define entrepreneurship.
05.02 Describe the importance of entrepreneurship to the American economy.
05.03 List the advantages and disadvantages of business ownership.
05.04 Identify the risks involved in ownership of a business.
05.05 Identify the necessary personal characteristics of a successful entrepreneur.
05.06 Identify the business skills needed to operate a small business efficiently and effectively.
05.07 Identify basic occupational licensing and insurance.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Advanced Automotive Mechanics PROGRAM NUMBER: 8711000

COURSE TITLE: Advanced Automotive Mechanics 1 COURSE NUMBER: 8711000

COURSE DESCRIPTION:

This course is designed to provide instruction in engine repair service, manual drive train service, automatic transmission service as well as employability skills and entrepreneurship.

01.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

01.01 Analyze engine performance.
01.02 Perform running cylinder balance tests.
01.03 Perform cylinder compression tests.
01.04 Check the performance of engines equipped with on-board computers.
01.05 Inspect, remove and replace points and condensers. (ASE)
01.06 Remove and replace distributor. (ASE)
01.07 Check the distributor advance in a vehicle.
01.08 Remove distributor; inspect, test and service.
01.09 Inspect and test primary circuits.
01.10 Remove and replace coils.
01.11 Remove and replace ignition switches and resistors.
01.12 Inspect, remove and replace ignition wires, caps and rotors.
01.13 Remove, gap and replace spark plugs. (ASE)
01.14 Service electronic ignition systems.
01.15 Service air cleaners. (ASE)
01.16 Inspect, remove and replace fuel filters. (ASE)
01.17 Measure fuel flow and pressure.
01.18 Remove and replace fuel lines (ASE)
01.19 Remove and replace fuel pumps. (ASE)
01.20 Adjust idle speed.
01.21 Clean and adjust chokes. (ASE)
01.22 Inspect, remove and replace manifold control valves.
01.23 Remove and replace fuel injection system filters.
01.24 Set idle speed to specifications.
01.25 Remove and replace fuel injectors. (ASE)
01.26 Service throttle body fuel injection systems.
01.27 Service ported fuel injection systems.
01.28 Service positive crankcase ventilation (PCV) systems. (ASE)
01.29 Service evaporative control systems. (ASE)
01.30 Service thermostatic air cleaners. (ASE)
01.31 Service air-injection systems. (ASE)
01.32 Service exhaust gas recirculation (EGR) systems. (ASE)
01.33 Inspect, remove and replace catalytic converter. (ASE)
01.34 Diagnose mechanical, ignition and fuel emission problems.
01.35 Inspect, remove and replace exhaust system components. (ASE)
01.36 Inspect, remove and replace catalytic converters. (ASE)

02.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

02.01 Performance test automatic transmissions.
02.02 Change transmission oil and filter. (ASE)
02.03 Adjust linkage from the engine.
02.04 Adjust shift linkage. (ASE)

02.05 Adjust neutral safety switches.
02.06 Remove and replace external gaskets and seals.
02.07 Test vacuum shift modulator. (ASE)
02.08 Adjust bands. (ASE)
02.09 Pressure flush transmission cooler assemblies.

03.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The student will be able to:

03.01 Diagnose drive line problems.
03.02 Diagnose and performance test manual transmission problems.
03.03 Inspect drive shafts, universal joints and center bearings.
03.04 Lubricate universal joints. (ASE)
03.05 Remove and replace transmission mounts. (ASE)
03.06 Remove and replace transmissions.
03.07 Adjust shift linkage. (ASE)
03.08 Adjust clutches. (ASE)
03.09 Remove and replace extension housing seals and bushings. (ASE)
03.10 Remove and replace clutches, release bearings, linkage and pilot bearings.
03.11 Rebuild or replace clutch master and slave cylinders. (ASE)
03.12 Remove and replace universal joints. (ASE)
03.13 Remove and replace speedometer gears and service speedometer cables. (ASE)
03.14 Remove and replace drive axle bearings and seals. (ASE)
03.15 Service and repair differentials. (ASE)
03.16 Remove and replace trans-axle assemblies.
03.17 Adjust trans-axle shifting controls.
03.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
03.19 Inspect, remove and replace constant-velocity universal joints.

04.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

04.01 Clean engines. (ASE)
04.02 Remove and replace motor mounts.
04.03 Check valve guides for wear.
04.04 Reface valves and seats.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

05.01 Define entrepreneurship.
05.02 Describe the importance of entrepreneurship to the American economy.
05.03 List the advantages and disadvantages of business ownership.
05.04 Identify the risks involved in ownership of a business.
05.05 Identify the necessary personal characteristics of a successful entrepreneur.
05.06 Identify the business skills needed to operate a small business efficiently and effectively.
05.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Advanced Drafting

CODE NUMBER: Secondary 8726000 Postsecondary _______

Florida CIP 0648.010600

SECONDARY SCHOOL CREDITS 2 COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514239), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, mathematical skills, safe and efficient work practices, and the development of detailed working drawings and related specifications for the students chosen drafting field.

Listed below are the courses that comprise this program when offered at the secondary level:

8726010	Advanced Drafting 1
8726020	Advanced Drafting 2

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of the many types of drafting tools and equipment, including computer aided drafting and design systems, office reproduction equipment, technical publication and reference materials, and drafting materials/supplies common to industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Completion of the 4 credit core Drafting program is a prerequisite for entry into this program. A satisfactory completer of the Advanced Drafting program (8726000) will be given up to 300 hours credit towards the following postsecondary adult vocational drafting options:

Architectural Drafting	(I480102)
Civil/Structural Drafting	(I480103)
Electrical/Electronics Drafting	(I480104)
Mechanical Design Technology	(I150805)
Mechanical Drafting	(I480105)

The cooperative method of instruction may be utilized for this program.

Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply advanced drafting skills.
02. Apply advanced dimensioning skills.
03. Utilize drafting applications.
04. Prepare advanced technical drawings.
05. Prepare advanced computer aided drawings.
06. Read, analyze, interpret, and write technical reports.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: 8726000

PROGRAM TITLE: Advanced Drafting — POSTSECONDARY NUMBER:

01.0 APPLY ADVANCED DRAFTING SKILLS--The student will be able to:

01.01 Use conversion tables for fractions, decimals and metric measurements for advanced applications.
01.02 Refine freehand and other lettering techniques.
01.03 Prepare pictorial drawings.

02.0 APPLY ADVANCED DIMENSIONING SKILLS--The student will be able to:

02.01 Prepare drawings containing linear, angular, and circular standard dimensions.
02.02 Prepare drawings using metric dimensions.
02.03 Prepare drawings using advanced dimensioning techniques.

03.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

03.01 Identify and use the various drafting and graphic appliques.
03.02 Use cut and paste techniques.
03.03 Prepare overlay drawings.
03.04 Make drawing changes on a sepia.
03.05 Apply inking techniques.
03.06 Utilize technical math skills.

04.0 PREPARE ADVANCED TECHNICAL DRAWINGS --The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal, vertical, and inclined surfaces; circles and/ or arcs.
04.03 Prepare drawings incorporating partial views, removed details, and conventional brakes.
04.04 Prepare drawings containing secondary auxiliary views.
04.05 Prepare a sectional assembly drawing applying material symbols.

05.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

05.01 Refine hardware/software skills.
05.02 Prepare CAD drawings.

06.0 READ, ANALYZE, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

06.01 Analyze content of technical report.
06.02 Prepare abstract of technical report.
06.03 Compose technical report.

STUDENT PERFORMANCE STANDARDS　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　COURSE CREDIT: 1

PROGRAM TITLE: Advanced Drafting　PROGRAM NUMBER: 8726000

COURSE TITLE: Advanced Drafting 1　COURSE NUMBER: 8726010

COURSE DESCRIPTION:

1.0 APPLY ADVANCED DRAFTING SKILLS--The student will be able to:

01.01 Use conversion tables for fractions, decimals and metric measurements for advanced applications.
01.02 Refine freehand and other lettering techniques.
01.03 Prepare pictorial drawings.

02.0 APPLY ADVANCED DIMENSIONING SKILLS--The student will be able to:

02.01 Prepare drawings containing linear, angular, and circular standard dimensions.
02.02 Prepare drawings using metric dimensions.
02.03 Prepare drawings using advanced dimensioning techniques.

03.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

03.01 Identify and use the various drafting and graphic appliques.
03.02 Use cut and paste techniques.
03.03 Prepare overlay drawings.
03.04 Make drawing changes on a sepia.
03.05 Apply inking techniques.
03.06 Utilize technical math skills.

STUDENT PERFORMANCE STANDARDS　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　COURSE CREDIT: 1

PROGRAM TITLE: Advanced Drafting　PROGRAM NUMBER: 8726000

COURSE TITLE: Advanced Drafting 2　COURSE NUMBER: 8726020

COURSE DESCRIPTION:

04.0 PREPARE ADVANCED TECHNICAL DRAWINGS --The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal, vertical, and inclined surfaces; circles and/ or arcs.
04.03 Prepare drawings incorporating partial views, removed details, and conventional brakes.
04.04 Prepare drawings containing secondary auxiliary views.
04.05 Prepare a sectional assembly drawing applying material symbols.

05.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

05.01 Refine hardware/software skills.
05.02 Prepare CAD drawings.

06.0 READ, ANALYZE, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

06.01 Analyze content of technical report.
06.02 Prepare abstract of technical report.
06.03 Compose technical report.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Advanced Masonry

CODE NUMBER: Secondary 8722800 Postsecondary ______________

Florida CIP 0646.011202

SECONDARY SCHOOL CREDITS 2 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 X 9-12 ___Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G TROWEL TR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as brick masons (87302537). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: orientation to the industry; blueprint reading and specifications; related mathematics; properties and characteristics of brick; and trade terms.

The course content should also include training in communication leadership, human relations and employability skills; and safe, efficient work practices. Listed below are the courses that comprise this program when offered at the secondary level:

8722810	Advanced Masonry 1
8722820	Advanced Masonry 2

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

Completion of the Masonry Skills Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization area concurrently may be necessary .

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform advanced lay out to industry standards.
02. Lay foundations to industry standards.
03. Perform special masonry construction.
04. Demonstrate proficiency in masonry construction details.
05. Demonstrate appropriate communication skills.
06. Demonstrate appropriate math skills.
07. Demonstrate appropriate understanding of basic science.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8722800

PROGRAM TITLE: Advanced Masonry POSTSECONDARY NUMBER:

01.0 PERFORM ADVANCED LAY OUT TO INDUSTRY STANDARDS--The student will be able to:

01.01 Establish building layouts.
01.02 Use a transit to establish level.
01.03 Erect batter boards and locate building lines.
01.04 Layout building lines using the six-eight-ten rule to check for squareness.
01.05 Make a story pole.
01.06 Identify measuring tools.
01.07 List uses of modular and spacing rules.
01.08 Identify symbols and abbreviations.
01.09 List items found in a set of masonry symbols.
01.10 List items on a detail drawing.
01.11 Scale a drawing using an architect's scale.
01.12 Read and interpret a simple blueprint.
01.13 Interpret a finish schedule.
01.14 Identify types of levels.
01.15 Identify types of self reading rods.
01.16 List common errors contributing to incorrect measurements.
01.17 Identify hand motions used by an instrument person.
01.18 Read a self reading rod.
01.19 Setup and adjust a builder's level.
01.20 Erect and inspect scaffolding in accordance with Occupational Safety Health Administration (OSHA) standards.
01.21 Lay out using common bond.
01.22 Lay out using English cross bond.
01.23 Lay out using Flemish cross bond.
01.24 Lay out using Dutch cross bond.
01.25 Lay out using 1/3 bond.
01.26 Lay out using stack bond.

02.0 LAY FOUNDATIONS TO INDUSTRY STANDARDS--The student will be able to:

02.01 Lay out footings.
02.02 Place rebar.
02.03 Place and rough-finish concrete.
02.04 Lay-out and establish grades for foundations.
02.05 Establish corners and lay out concrete block according to a specific bonding plan.
02.06 Lay foundation walls to joist and brick shelf height.
02.07 Waterproof foundation walls.
02.08 Install flashing, anchor bolts, termite shields and weep holes.

03.0 PERFORM SPECIAL MASONRY CONSTRUCTION--The student will be able to:

03.01 Construct a column using a given plan.
03.02 Construct a pier using a given plan.

04.0 DEMONSTRATE PROFICIENCY IN MASONRY CONSTRUCTION DETAILS--The student will be able to:

04.01 Identify five types of arches (flat, jack, Gothic, semicircle, Corinthian).
04.02 List purposes of arches.
04.03 Identify types of paving.

04.04 Identify types of paving patterns.
04.05 List purposes of masonry paving.
04.06 Identify types of precast panels.
04.07 List purposes of grouting.
04.08 Construct paving using a given plan.
04.09 Identify types of fireplaces.
04.10 List factors to consider when constructing fireplaces and chimneys.
04.11 List characteristics of firebrick.
04.12 Distinguish between firebrick mortar and brick mortar.
04.13 Demonstrate the ability to butter firebrick.
04.14 Construct a firebox.
04.15 Construct a fireplace.
04.16 Identify components of fireplaces and chimneys.
04.17 Lay out and construct a fireplace and chimney to given plans.
04.18 Lay out a wall section using glass block or other new local materials.
04.19 Calculate area and volume problems.
04.20 Estimate materials needed for a specific job.
04.21 Solve estimating problems.
04.22 Solve basic ratio and proportion problems.
04.23 Identify types of drawings.
04.24 Identify symbols on blueprints.
04.25 Explain the difference between a plan view, an elevation and a section on blueprints.
04.26 Interpret a set of specifications.
04.27 Read and interpret local building codes and national standards.

05.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

05.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
05.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
05.03 Read and follow written and oral instructions.
05.04 Answer and ask questions coherently and concisely.
05.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
05.06 Demonstrate appropriate telephone/communication skills.

06.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

06.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
06.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
06.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
06.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
06.05 Demonstrate an understanding of federal, state and local taxes and their computation.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

07.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
07.02 Draw conclusions or make inferences from data.
07.03 Identify health related problems which may result from exposure to

work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

07.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS -- The student will be able to.

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make appropriate job changes.
08.09 Demonstrate acceptable employee health habits.
08.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
08.11 Identify or demonstrate acceptable personal grooming habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.
09.07 Identify basic occupational licensing and insurance.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Advanced Masonry	PROGRAM NUMBER:	8722800
COURSE TITLE:	Advanced Masonry 1	COURSE NUMBER:	8722810

COURSE DESCRIPTION:

01.0 PERFORM ADVANCED LAY OUT TO INDUSTRY STANDARDS--The student will be able to:

01.01 Establish building layouts.
01.02 Use a transit to establish level.
01.03 Erect batter boards and locate building lines.
01.04 Lay out building lines using the six-eight-ten rule to check for squareness.
01.05 Make a story pole.
01.06 Identify measuring tools.
01.07 List uses of modular and spacing rules.
01.08 Identify symbols and abbreviations.
01.09 List items found in a set of masonry symbols.
01.10 List items on a detail drawing.
01.11 Scale a drawing using an architect's scale.
01.12 Read and interpret a simple blueprint.
01.13 Interpret a finish schedule.
01.14 Identify types of levels.
01.15 Identify types of self reading rods.
01.16 List common errors contributing to incorrect measurements.
01.17 Identify hand motions used by an instrument person.
01.18 Read a self reading rod.
01.19 Setup and adjust a builder's level.
01.20 Erect and inspect scaffolding in accordance with Occupational Safety Health Administration (OSHA) standards.
01.21 Lay out using common bond.

02.0 LAY FOUNDATIONS TO INDUSTRY STANDARDS--The student will be able to:

02.01 Lay out footings.
02.02 Place rebar.
02.03 Place and rough-finish concrete.
02.04 Lay out and establish grades for foundations.
02.05 Establish corners and lay out concrete block according to a specific bonding plan.
02.06 Lay foundation walls to joist and brick shelf height.
02.07 Waterproof foundation walls.
02.08 Install flashing, anchor bolts, termite shields and weep holes.

03.0 PERFORM SPECIAL MASONRY CONSTRUCTION--The student will be able to:

03.01 Construct a column using a given plan.
03.02 Construct a pier using a given plan.

04.0 DEMONSTRATE PROFICIENCY IN MASONRY CONSTRUCTION DETAILS--The student will be able to:

04.01 Identify five types of arches (flat, jack, Gothic, semicircle, Corinthian).
04.02 List purposes of arches.
04.03 Identify types of paving.
04.04 Identify types of paving patterns.

04.05 List purposes of masonry paving.
04.06 Identify types of precast panels.
04.07 List purposes of grouting.
04.08 Construct paving using a given plan.
04.09 Identify types of fireplaces.
04.10 List factors to consider when constructing fireplaces and chimneys.
04.11 List characteristics of firebrick.
04.12 Distinguish between firebrick mortar and brick mortar.
04.13 Demonstrate the ability to butter firebrick.
04.14 Construct a firebox.
04.15 Construct a fireplace.
04.16 Identify components of fireplaces and chimneys.
04.17 Lay out and construct a fireplace and chimney to given plans.
04.18 Lay out a wall section using glass block or other new local materials.
04.19 Calculate area and volume problems.
04.20 Estimate materials needed for a specific job.
04.21 Solve estimating problems.
04.22 Solve basic ratio and proportion problems.
04.23 Identify types of drawings.
04.24 Identify symbols on blueprints.
04.25 Explain the difference between a plan view, an elevation and a section on blueprints.
04.26 Interpret a set of specifications.
04.27 Read and interpret local building codes and national standards.

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STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　COURSE CREDIT: 1

PROGRAM TITLE: Advanced Masonry　　PROGRAM NUMBER: 8722800

COURSE TITLE: Advanced Masonry 2　　COURSE NUMBER: 8722820

COURSE DESCRIPTION:

05.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

05.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
05.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
05.03 Read and follow written and oral instructions.
05.04 Answer and ask questions coherently and concisely.
05.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
05.06 Demonstrate appropriate telephone/communication skills.

06.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

06.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
06.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
06.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
06.04 Determine the correct purchase price, to include sales tax for a

materials list containing a minimum of six items.
06.05 Demonstrate an understanding of federal, state and local taxes and their computation.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

07.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
07.02 Draw conclusions or make inferences from data.
07.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
07.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application for correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge or how to make appropriate job changes.
08.09 Demonstrate acceptable employee health habits.
08.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.
09.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK · PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aeronautical Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.080100

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS X POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVEL(S): ___7-9 ____9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ____ Other _____________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as engineering technicians (22599228), research mechanics (002.280-010), flight test data transcribers (002.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to assist aeronautical engineers in collecting research data relevant to the operation of aircraft and the design, testing, and development of propulsion, control and guidance systems of aircraft and aerospace vehicles.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in applied strength of materials, thermodynamics, and electrical/electronic theory. Strong emphasis is placed on instrumentation and guidance and propulsion systems testing and modification.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is Associate Degree.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Demonstrate understanding of fundamentals of aeronautics.
02. Demonstrate understanding of aircraft structure and design.
03. Demonstrate knowledge of aircraft communication equipment.
04. Demonstrate knowledge of aircraft electronic navigation equipment.
05. Demonstrate knowledge of aircraft test equipment and recorders.
06. Read and interpret Federal Aviation Administration manufacturing regulations.
07. Prepare, analyze and evaluate technical reports and data.
08. Develop an understanding of manufacturing processes and materials.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Aeronautical Technology POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

01.01 Differentiate between aeronautics and aerodynamics.
01.02 State and give examples of Newton's three laws of motion.
01.03 Name and compare the four forces of flight.
01.04 Describe an airfoil.
01.05 State how lift is produced.
01.06 Discuss how and why an airplane stalls.
01.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
01.08 Explain the magnetic compass.
01.09 Apply the methods of analyzing the fundamentals laws relating to the operation of aircraft engines, both reciprocating and jet.
01.10 Apply the fundamental laws of aerodynamic forces, moments, thermodynamics and stresses to the performance of engines, and aircraft.
01.11 Discuss the development of aircraft engines and structures and their problems in flight.
01.12 Describe and apply the Bernoulli's theory to the many aspects of aircraft flight and operation of aircraft parts.

02.0 DEMONSTRATE UNDERSTANDING OF AIRCRAFT STRUCTURE AND DESIGN--The student will be able to:

02.01 Describe the construction and operation of the methods of propulsion by propeller, and jet.
02.02 Explain the conditions and effects of subsonic, trans-sonic, supersonic and hypersonic flow of gases.
02.03 Describe the aircraft units and control surfaces, their purpose, and operation, including fuselage, tail surfaces, and wing surfaces.
02.04 State control devices and the methods necessary for operation of aircraft control surfaces.
02.05 Discuss the tension and compression exerted on structural parts in flight.

03.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT COMMUNICATION EQUIPMENT--The student will be able to:

03.01 Operate and explain function of VHF radios.
03.02 Operate and explain function of UHF radios.
03.03 Explain function and frequencies of ELT's.
03.04 Utilize proper phraseology in using radios.
03.05 Discuss uses and limitations of portable transceivers.
03.06 Explain the principle of basic radio wave theory and its application to radio aids to flight and navigation.
03.07 Explain the concepts and underlying principles of ultra high frequency, LORAN, Microwave, Doppler effect, OMEGA, directional and non-directional antenna.

04.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT ELECTRONIC NAVIGATION EQUIPMENT--The student will be able to:

04.01 Define radio navigation.

04.02 Explain the magnetic compass.
04.03 Explain VOR navigation.
04.04 Explain the ADF.
04.05 Explain DME and RNAV principles.
04.06 Demonstrate usage of magnetic coordinates.
04.07 Demonstrate and explain the flight computer.
04.08 Explain sectional charts and their use.
04.09 Explain enroute and terminal charts.
04.10 Explain lost communications emergency procedures VFR and IFR.
04.11 Read and interpret aircraft performance charts.
04.12 Plot and explain a cross-country course.
04.13 Define and explain wing tip bearing, Isosceles triangle method, intercepts and Homing.
04.14 Explain Loran principles and operational usage.

05.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT TEST EQUIPMENT AND RECORDERS--The student will be able to:

05.01 Describe the differences between the various destructive and non-destructive testing methods.
05.02 State the tolerance of acceptable errors in testing machines used for testing specimens for different uses and functions.
05.03 Explain the various methods of testing and related equipment such as by acoustic-signature analysis, compression, electrified particles, gamma rays, infrared methods, magnetic particles, microwave method, by penetrants, by radiation, radiographic, ultrasonic, by x-rays.

06.0 READ AND INTERPRET FEDERAL AVIATION ADMINISTRATION MANUFACTURING REGULATIONS--The student will be able to:

06.01 Explain the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, Safety Regulations of Civil Aeronautics.
06.02 Explain Section 603 of FAA 1958 relation to aircraft certificates.
06.03 Discuss the Federal Aviation Regulations (FAR's) related to Section 603 of FAA 1958.
06.04 Compare, and describe type certificates, production certificates, and air worthiness certificates.
06.05 Explain Section 603 (a) (2), Section 603 (b), and 603 (c) relating to type, production, and airworthiness certificates.
06.06 State and compare FAR's 21, 23, 25, 27, 29, 31, 33 and 35.

07.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL REPORTS AND DATA--The student will be able to:

07.01 State the five basic guidelines for preparation of technical reports.
07.02 Compare the difference between technical and literary description.
07.03 Describe the techniques used in technical report writing.
07.04 Discuss the arrangement of the technical written report--such as cause and effect, inductive and deductive, enumeration and classification, problems and solution.
07.05 Explain the preparatory work or stages in the process such as the writing, the drafts, use of the library, and polish style.
07.06 List types of reports, and describe use of illustrations.
07.07 Discuss the steps in developing an oral presentation.

08.0 DEVELOP AN UNDERSTANDING OF MANUFACTURING PROCESSES AND MATERIALS--The student will be able to:

08.01 Describe the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, Safety Regulations of Civil Aeronautics.
08.02 State the Federal Aviation Regulations (FAR's) related to the manufacturing aspect of Section 603 of Title VI, of the Federal Aviation Act of 1958.
08.03 Compare the governing FAR's with the existing state of the art in manufacturing processes and materials for compliance.
08.04 Define and compare the various manufacturing processes, including casting methods, powder metallurgy, forging processes, extrusion processes, metal stamping and forming, machine processes, automatic machines and numerical control, welding processes, assembly method, and protective coatings.
08.05 Describe the various materials--their characteristics and applications, including iron and steel, alloy steels, non-ferrous metals (aluminum, magnesium, copper, zinc, nickel, and alloys) plastics, and ceramics.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and pereimter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct pufshcse price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.

12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July 1993

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Mechanics

CODE NUMBER: Secondary 8703000 Postsecondary ________

Florida CIP 0647.022100

SECONDARY
SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT
VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 x 9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational ____ Other 30-31

CERTIFICATION COVERAGE: AC HEAT ME @ 7 G REFRG MECH G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as heating, air conditioning and refrigeration mechanics (85902646), air conditioning installer-servicers (637.261-010), or to provide supplemental training for persons previously or currently employed in these occupations. Individuals completing this program will be qualified to work in the industry under the supervision of a master craftsman.

This program is the Florida common core air conditioning refrigeration and heating program.

The course content includes, but is not limited to: planning, installation, testing and servicing of air conditioning, refrigeration and heating systems and components; servicing, installing and troubleshooting electrical and mechanical components; testing, diagramming and solving problems in air conditioning, refrigeration and heating equipment; recordkeeping; basic supervisory skills; ;use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

The course content should also include training in communications, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8703010	Air Conditioning, Refrigeration and Heating 1
8703020	Air Conditioning, Refrigeration and Heating 2
8703030	Air Conditioning, Refrigeration and Heating 3
8703040	Air Conditioning, Refrigeration and Heating 4
8703050	Air Conditioning, Refrigeration and Heating 5
8703060	Air Conditioning, Refrigeration and Heating 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use of specialized tools and equipment, and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: A training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP) Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0 and Reading 9.0. This grade level number corresponds to a grade level equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with section 230.643 F.S.

The average length of this program for the typical student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Know the history/concepts of refrigeration and air conditioning.
02. Demonstrate a working knowledge of matter and heat behavior.
03. Demonstrate a working knowledge of fluids, pressures and refrigerants.
04. Demonstrate safe working practices and procedures.
05. Demonstrate appropriate use of tools and accessories.
06. Utilize and operate refrigeration-servicing and testing equipment.
07. Demonstrate a working knowledge in the use of piping, tubing and fittings used in VACR.
08. Demonstrate a working knowledge in basic electricity and electrical components.
09. Demonstrate a working knowledge in residential control system heating/cooling.
10. Demonstrate a working knowledge of evaporators, compressors, condensers and metering devices.
11. Demonstrate a working knowledge of accessories.
12. Demonstrate a working knowledge of mechanical/electronic

filtration and air handling fans.
13. Demonstrate a working knowledge of codes and standards.
14. Demonstrate a working knowledge in heating start-up, checkout and operation.
15. Demonstrate a working knowledge in air conditioning start-up and service problem analysis.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8703000

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Mechanics POSTSECONDARY NUMBER:

01.0 KNOW THE HISTORY/CONCEPTS OF REFRIGERATION AND AIR CONDITIONING--The student will be able to:

01.01 Identify the four major refrigeration components.
01.02 Identify the high and low sides of the system.
01.03 Define the difference between air conditioning and refrigeration.
01.04 Differentiate between 'split systems' and 'package systems'.
01.05 Describe the benefits of conditioned air.
01.06 Describe some of today's current issues regarding air conditioning--industry concerns and future ramifications.

02.0 DEMONSTRATE A WORKING KNOWLEDGE OF MATTER AND HEAT BEHAVIOR--The student will be able to:

02.01 Describe matter and heat.
02.02 Distinguish between the three states of matter.
02.03 Describe the direction of heat flow.
02.04 Describe the three methods of heat transfer.
02.05 Describe the boiling/saturation and superheat/subcooling points.
02.06 Describe the freezing point.
02.07 Describe critical temperature.
02.08 Describe absolute zero.
02.09 Describe the difference between heat and temperature.
02.10 Describe the difference between latent and sensible heat.

03.0 DEMONSTRATE A WORKING KNOWLEDGE OF FLUIDS, PRESSURES AND REFRIGERANTS--The student will be able to:

03.01 Define pressures and fluids.
03.02 Calculate absolute and gauge pressures.
03.03 Measure absolute and gauge pressures.
03.04 Explain how fluids react in a closed vs. open system.
03.05 Compare temperatures and pressures (P/T Chart).
03.06 Explain how fluids flow.
03.07 Define the properties of refrigerants.
03.08 Describe the uses for different refrigerants.
03.09 Define 'color-coding' of cylinders.
03.10 Explain classifications of refrigerants.
03.11 List proper methods of transfer and storage.
03.12 Trace the refrigeration cycle.
03.13 Describe the benefits of superheat and subcooling.
03.14 Explain the effects of improper refrigerant in a system.

04.0 DEMONSTRATE SAFE WORKING PRACTICES AND PROCEDURES-- The student will be able to:

04.01 Identify and use good housekeeping practices in the laboratory.
04.02 Describe the reasons for regular safety meetings.
04.03 Explain the reasons for company safety policies.
04.04 Explain and follow OSHA standards.
04.05 Explain the need for employee background checks and medical examinations.
04.06 Identify and use appropriate personal safety equipment.
04.07 Identify and use proper fire extinguishers and other such safety

devices.
04.08 Identify and use emergency first aid procedures.
04.09 Identify and use safe handling practices as they relate to hazardous and volatile fluids.
04.10 Apply specific safety practices as they relate to contaminated refrigerants.
04.11 Apply specific safety and recovery practices as they relate to chlorofluorocarbons.
04.12 Apply specific safety practices as they relate to handling and storing cylinders.
04.13 Select and wear proper protective clothing and equipment.
04.14 Identify and use proper tools/materials for the job.
04.15 Identify and use specific safety practices when soldering and brazing.
04.16 Identify and use OSHA safety practices when removing charging lines, to prevent frostbite.
04.17 Identify and use OSHA safety practices while handling ladders.
04.18 Identify and use OSHA safety practices when using guardrails.
04.19 Identify when and where to weld.
04.20 Identify and use OSHA safety practices when working near moving equipment.
04.21 Identify correct locations and procedures for hanging fire extinguishers.
04.22 Identify and use OSHA safety practices relating to a ground fault circuit interrupter.
04.23 Identify and use OSHA safety practices relating to frayed cords.
04.24 Identify and use OSHA safety practices as they relate to the length and size of the extension cord.
04.25 Identify and practice OSHA safety procedures when working with electricity around water.
04.26 Define and use safety procedures when working with gases and combustibles.

5.0 DEMONSTRATE APPROPRIATE USE OF TOOLS AND ACCESSORIES--The student will be able to:

05.01 Identify and use basic tools and accessories.
05.02 Identify and use power tools.
05.03 Identify and use fasteners.
05.04 Identify and use pipe and tubing tools.
05.05 Describe and apply appropriate maintenance processes for tools and accessories.
05.06 Identify and use specialized tools of the trade.

06.0 UTILIZE AND OPERATE REFRIGERATION-SERVICING AND TESTING EQUIPMENT--The student will be able to:

06.01 Measure pressures with the refrigeration gauge manifold.
06.02 Evacuate system with a two stage vacuum pump.
06.03 Measure temperatures with bimetal and electronic thermometers.
06.04 Check for refrigeration leaks with electronic, halogen, torch and liquid leak detector.
06.05 Charge air conditioning/refrigeration systems with vapor in low side.
06.06 Charge air conditioning/refrigeration system with liquid in high side.

07.0 DEMONSTRATE A WORKING KNOWLEDGE IN THE USE OF PIPING, TUBING AND RELATED COMPONENTS--The student will be able to:

07.01 Identify, install and leak test types of pipe, tubing and fittings used in HVACR.
07.02 Identify and use soldering and brazing alloys used in HVACR.
07.03 Select and use appropriate soldering and brazing alloys.
07.04 Connect tubing using flared fittings.

07.05 Connect tubing using compression fittings.
07.06 Connect copper tubing using a swaged joint.
07.07 Bend copper tubing using tube benders.
07.08 Identify and use types of torches.
07.09 Solder and braze copper tubing.
07.10 Silver braze brass and steel fitting to copper tubing.
07.11 Connect aluminum tubing using solderless connector.
07.12 Understand procedures of installing pipe and tubing insulation.
07.13 Explain the procedures required for installing a sweat sight glass.
07.14 Explain the procedures required for installing a solenoid valve.
07.15 Explain the procedures required for installing a thermostatic expansion valve.
07.16 Explain the procedures required for installing a liquid-line filter-dryer, suction-line filter-dryer and heat pump biflow.
07.17 Explain the procedures required for installing a check valve.
07.18 Explain the procedures required for installing a four-way reversing valve.
07.19 Understand procedures of installing electronic expansion valve.

08.0 DEMONSTRATE A WORKING KNOWLEDGE IN BASIC ELECTRICITY AND ELECTRICAL COMPONENTS--The student will be able to:

08.01 Explain how electricity is produced.
08.02 Define watts, ohms, volts and amps.
08.03 Identify and use appropriate procedures to troubleshoot fuses and breakers.
08.04 Measure wattage, resistance, voltage and amperage using appropriate meter.
08.05 Troubleshoot and explain the function of relays.
08.06 Troubleshoot and explain the function of contactors.
08.07 Troubleshoot and explain the function of a capacitor.
08.08 Troubleshoot and explain the function of a defrost timer.
08.09 Troubleshoot and explain the function of a crankcase heater.
08.10 Troubleshoot and explain the function of water valves.
08.11 Troubleshoot and explain the function of thermostats.

09.0 DEMONSTRATE A WORKING KNOWLEDGE IN RESIDENTIAL CONTROL SYSTEM HEATING/COOLING--The student will be able to:

09.01 Draw and apply a schematic wiring diagram of a low voltage control system.
09.02 Wire a complete heating/cooling system, line and low voltage.
09.03 Connect field control wiring on heat pump installation.
09.04 Identify and troubleshoot controls for heating and cooling systems.
09.05 Interpret and apply a schematic wiring diagram of a low voltage control system.
09.06 Adjust heat anticipator on thermostat.
09.07 Identify, install and troubleshoot a single stage heat and single stage cool thermostat.
09.08 Identify, install and troubleshoot a two stage hat and two stage cool thermostat.
09.09 Analyze electronic circuit containing power source, control card, sensor and control device.
09.10 Explain basic heat pump, electrical and mechanical operations.
09.11 Explain the operation of a reversing valve.
09.12 Describe the purpose and function of outdoor thermostats.
09.13 Explain the operation of defrost controls.
09.14 Explain the operation of auxiliary heat.
09.15 Connect a single-phase motor.
09.16 Reverse rotation of single-phase motor.
09.17 Connect three-phase motor.
09.18 Correct the causes of electrical problems.

09.19 Identify and correct the causes of mechanical problems.

10.0 DEMONSTRATE A WORKING KNOWLEDGE OF EVAPORATORS, COMPRESSORS, CONDENSERS AND METERING DEVICES--The student will be able to:

10.01 Explain the operation and use of bare-tube evaporators.
10.02 Explain the operation and use of finned evaporators.
10.03 Explain the operation and use of plate evaporators.
10.04 Explain the operation and use of unit cooler evaporators.
10.05 Explain the operation and use of a hermetic compressor.
10.06 Explain the operation of an open type compressor.
10.07 Explain the operation of a semi-hermetic type compressor.
10.08 Explain the methods of compression.
10.09 Analyze the operating condition of a compressor.
10.10 Explain the operation and use of air cooled condensers.
10.11 Explain the operation and use of water cooled condensers.
10.12 Explain the operation and use of a water tower.
10.13 Describe the maintenance required of a water cooled system.
10.14 Explain the operation and performance of a condenser.
10.15 Define capillary tubes.
10.16 Define TXV (thermostat expansion valve).
10.17 Explain the operation of fixed orifice devices.

11.0 DEMONSTRATE A WORKING KNOWLEDGE OF ACCESSORIES--The student will be able to:

11.01 Identify and explain location and use of receivers.
11.02 Identify and explain location and use of driers/filters.
11.03 Identify and explain location and use of solenoid valves.
11.04 Identify and explain location and use of heat exchangers.
11.05 Identify and explain location and use of humidifiers.
11.06 Explain the operations of front seat, mid position and back.
11.07 Identify and explain location and use of the condensate pump.
11.08 Identify and explain location and use of a check valve.
11.09 Identify and explain the operation of access valves.

12.0 DEMONSTRATE A WORKING KNOWLEDGE OF MECHANICAL/ELECTRONIC FILTRATION AND AIR HANDLING FANS--The student will be able to:

12.01 Identify and explain location and use of disposable mechanical filters.
12.02 Identify and explain location and use of permanent foam, mesh and fiber mechanical filters.
12.03 Identify and know location and use of high efficiency mechanical filters.
12.04 Describe and troubleshoot the operation of electronic air cleaners.
12.05 Identify and maintain centrifugal and axial fans.
12.06 Remove and replace centrifugal and axial fans.
12.07 Determine the proper direction of rotation on centrifugal and axial fans.
12.08 Adjust v-belt tension.
12.09 Determine wear and alignment of pulleys.

13.0 DEMONSTRATE A WORKING KNOWLEDGE OF CODES AND STANDARDS--The student will be able to:

13.01 Describe the reason for codes.
13.02 Discuss local codes.
13.03 Discuss standard codes.
13.04 Discuss uniform codes.
13.05 Identify codes and standards for the applicable area, locality or state.
13.06 Explain the relationship between codes and manufacturers' installation instructions.
13.07 Identify the purposes of the Air Cond. & Refrig. Inst., American Soc. of

Heating, Refrig. & Air Cond. Engnrs & Sheet Metal Air Cond. Contractors Natl. Assoc.

14.0 DEMONSTRATE A WORKING KNOWLEDGE IN HEATING START-UP, CHECKOUT AND OPERATION--The student will be able to:

14.01 Describe combustion theory.
14.02 Install a combustion heating unit to manufacturers' installation and operation requirements.
14.03 Determine the equipment electrical requirements.
14.04 Select and use appropriate tools and instruments.
14.05 Explain local codes and ordinances.
14.06 Apply good customer relations in classroom simulation.
14.07 Identify and explain air to air heat pump systems.
14.08 Identify and explain water to air heat pump systems.
14.09 Identify and explain water to water heat pump systems.
14.10 Identify and explain air to ground heat pump systems.
14.11 Identify and explain open loop heat pump systems.
14.12 Identify and explain closed loop heat pump systems.
14.13 Use tools and test equipment properly.
14.14 Determine equipment electrical requirements.
14.15 Determine the temperature drop across the outdoor coil on a heat pump.
14.16 Determine the temperature rise across the indoor coil on a heat pump.
14.17 Test for proper refrigerant charge in a residential heat pump.

15.0 DEMONSTRATE A WORKING KNOWLEDGE IN AIR CONDITIONING START-UP AND SERVICE PROBLEM ANALYSIS--The student will be able to:

15.01 Install an air conditioning system to manufacturers' installation and operation requirements.
15.02 Determine equipment electrical requirements.
15.03 Identify and use proper safety procedures when using tools and test equipment.
15.04 Explain local codes and ordinances.
15.05 Determine the temperature drop across the evaporator.
15.06 Determine the temperature rise across the condenser.
15.07 Determine proper charge in a residential air conditioning unit and measure superheat.
15.08 Read and comply with dispatch orders.
15.09 Write service report.
15.10 Apply good customer relations in classroom simulation.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competency in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify and adopt acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.

17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.
17.07 Demonstrate knowledge of state licensing requirements.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Air Conditioning, Refrigeration, Heating Mechanics
PROGRAM NUMBER: 8703000

COURSE TITLE: Air Conditioning, Refrigeration, and Heating Mechanics 1
COURSE NUMBER: 8703010

COURSE DESCRIPTION:

This course is designed to provide an introduction to air conditioning, refrigeration and heating repair and installation. Safety and employability skills are included.

01.0 KNOW THE HISTORY/CONCEPTS OF REFRIGERATION AND AIR CONDITIONING--The student will be able to:

01.01 Identify the four major refrigeration components.
01.02 Identify the high and low sides of the system.
01.03 Define the difference between air conditioning and refrigeration.
01.04 Differentiate between 'split systems' and 'package systems'.
01.05 Describe the benefits of conditioned air.
01.06 Describe some of today's current issues regarding air conditioning--industry concerns and future ramifications.

02.0 DEMONSTRATE A WORKING KNOWLEDGE OF MATTER AND HEAT BEHAVIOR--The student will be able to:

02.01 Describe matter and heat.
02.02 Distinguish between the three states of matter.
02.03 Describe the direction of heat flow.
02.04 Describe the three methods of heat transfer.
02.05 Describe the boiling/saturation and superheat/subcooling points.
02.06 Describe the freezing point.
02.07 Describe critical temperature.
02.08 Describe absolute zero.
02.09 Describe the difference between heat and temperature.
02.10 Describe the difference between latent and sensible heat.

03.0 DEMONSTRATE A WORKING KNOWLEDGE OF FLUIDS, PRESSURES AND REFRIGERANTS--The student will be able to:

03.01 Define pressures and fluids.
03.02 Calculate absolute and gauge pressures.
03.03 Measure absolute and gauge pressures.
03.04 Explain how fluids react in a closed vs. open system.
03.05 Compare temperatures and pressures (P/T Chart).
03.06 Explain how fluids flow.
03.07 Define the properties of refrigerants.
03.08 Describe the uses for different refrigerants.
03.09 Define 'color-coding' of cylinders.
03.10 Explain classifications of refrigerants.
03.11 List proper methods of transfer and storage.
03.12 Trace the refrigeration cycle.
03.13 Describe the benefits of superheat and subcooling.
03.14 Explain the effects of improper refrigerant in a system.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competency in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify and adopt acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.
17.07 Demonstrate knowledge of state licensing requirements.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Air Conditioning, Refrigeration, Heating Mechanics

PROGRAM NUMBER: 8703000

COURSE TITLE: Air Conditioning, Refrigeration, and Heating Mechanics 2

COURSE NUMBER: 8703020

COURSE DESCRIPTION:

This course is designed to provide instruction in industry practices and procedures, the appropriate use of tools, servicing and testing equipment.

04.0 DEMONSTRATE SAFE WORKING PRACTICES AND PROCEDURES-- The student will be able to:

04.01 Identify and use good housekeeping practices in the laboratory.
04.02 Describe the reasons for regular safety meetings.
04.03 Explain the reasons for company safety policies.
04.04 Explain and follow OSHA standards.
04.05 Explain the need for employee background checks and medical examinations.
04.06 Identify and use appropriate personal safety equipment.
04.07 Identify and use proper fire extinguishers and other such safety devices.
04.08 Identify and use emergency first aid procedures.
04.09 Identify and use safe handling practices as they relate to hazardous and volatile fluids.
04.10 Apply specific safety practices as they relate to contaminated refrigerants.

04.11 Apply specific safety and recovery practices as they relate to chlorofluorocarbons.
04.12 Apply specific safety practices as they relate to handling and storing cylinders.
04.13 Select and wear proper protective clothing and equipment.
04.14 Identify and use proper tools/materials for the job.
04.15 Identify and use specific safety practices when soldering and brazing.
04.16 Identify and use OSHA safety practices when removing charging lines, to prevent frostbite.
04.17 Identify and use OSHA safety practices while handling ladders.
04.18 Identify and use OSHA safety practices when using guardrails.
04.19 Identify when and where to weld.
04.20 Identify and use OSHA safety practices when working near moving equipment.
04.21 Identify correct locations and procedures for hanging fire extinguishers.
04.22 Identify and use OSHA safety practices relating to a ground fault circuit interrupter.
04.23 Identify and use OSHA safety practices relating to frayed cords.
04.24 Identify and use OSHA safety practices as they relate to the length and size of the extension cord.
04.25 Identify and practice OSHA safety procedures when working with electricity around water.
04.26 Define and use safety procedures when working with gases and combustibles.

05.0 DEMONSTRATE APPROPRIATE USE OF TOOLS AND ACCESSORIES--The student will be able to:

05.01 Identify and use basic tools and accessories.
05.02 Identify and use power tools.
05.03 Identify and use fasteners.
05.04 Identify and use pipe and tubing tools.
05.05 Describe and apply appropriate maintenance processes for tools and accessories.
05.06 Identify and use specialized tools of the trade.

06.0 UTILIZE AND OPERATE REFRIGERATION-SERVICING AND TESTING EQUIPMENT--The student will be able to:

06.01 Measure pressures with the refrigeration gauge manifold.
06.02 Evacuate system with a two stage vacuum pump.
06.03 Measure temperatures with bimetal and electronic thermometers.
06.04 Check for refrigeration leaks with electronic, halogen, torch and liquid leak detector.
06.05 Charge air conditioning/refrigeration systems with vapor in low side.
06.06 Charge air conditioning/refrigeration system with liquid in high side.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Air Conditioning, Refrigeration, Heating Mechanics PROGRAM NUMBER: 8703000

COURSE TITLE: Air Conditioning, Refrigeration, and Heating Mechanics 3 COURSE NUMBER: 8703030

COURSE DESCRIPTION:

This course is designed to provide instruction in electrical and electronic theory, related components and heating/cooling control systems.

08.0 DEMONSTRATE A WORKING KNOWLEDGE IN BASIC ELECTRICITY AND ELECTRICAL COMPONENTS--The student will be able to:

08.01 Explain how electricity is produced.
08.02 Define watts, ohms, volts and amps.
08.03 Identify and use appropriate procedures to troubleshoot fuses and breakers.
08.04 Measure wattage, resistance, voltage and amperage using appropriate meter.
08.05 Troubleshoot and explain the function of relays.
08.06 Troubleshoot and explain the function of contactors.
08.07 Troubleshoot and explain the function of a capacitor.
08.08 Troubleshoot and explain the function of a defrost timer.
08.09 Troubleshoot and explain the function of a crankcase heater.
08.10 Troubleshoot and explain the function of water valves.
08.11 Troubleshoot and explain the function of thermostats.

09.0 DEMONSTRATE A WORKING KNOWLEDGE IN RESIDENTIAL CONTROL SYSTEM HEATING/COOLING--The student will be able to:

09.01 Draw and apply a schematic wiring diagram of a low voltage control system.
09.02 Wire a complete heating/cooling system, line and low voltage.
09.03 Connect field control wiring on heat pump installation.
09.04 Identify and troubleshoot controls for heating and cooling systems.
09.05 Interpret and apply a schematic wiring diagram of a low voltage control system.
09.06 Adjust heat anticipator on thermostat.
09.07 Identify, install and troubleshoot a single stage heat and single stage cool thermostat.
09.08 Identify, install and troubleshoot a two stage hat and two stage cool thermostat.
09.09 Analyze electronic circuit containing power source, control card, sensor and control device.
09.10 Explain basic heat pump, electrical and mechanical operations.
09.11 Explain the operation of a reversing valve.
09.12 Describe the purpose and function of outdoor thermostats.
09.13 Explain the operation of defrost controls.
09.14 Explain the operation of auxiliary heat.
09.15 Connect a single-phase motor.
09.16 Reverse rotation of single-phase motor.
09.17 Connect three-phase motor.
09.18 Correct the causes of electrical problems.
09.19 Identify and correct the causes of mechanical problems.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Air Conditioning, Refrigeration, Heating Mechanics	PROGRAM NUMBER:	8703000
COURSE TITLE:	Air Conditioning, Refrigeration, and Heating Mechanics 4	COURSE NUMBER:	8703040

COURSE DESCRIPTION:

This course is designed to provide instruction in piping systems, refrigeration components and accessories, air-handlers and filtration systems.

07.0 DEMONSTRATE A WORKING KNOWLEDGE IN THE USE OF PIPING, TUBING AND RELATED COMPONENTS--The student will be able to:

07.01 Identify, install and leak test types of pipe, tubing and fittings used in HVACR.
07.02 Identify and use soldering and brazing alloys used in HVACR.
07.03 Select and use appropriate soldering and brazing alloys.
07.04 Connect tubing using flared fittings.
07.05 Connect tubing using compression fittings.
07.06 Connect copper tubing using a swaged joint.
07.07 Bend copper tubing using tube benders.
07.08 Identify and use types of torches.
07.09 Solder and braze copper tubing.
07.10 Silver braze brass and steel fitting to copper tubing.
07.11 Connect aluminum tubing using solderless connector.
07.12 Understand procedures of installing pipe and tubing insulation.
07.13 Explain the procedures required for installing a sweat sight glass.
07.14 Explain the procedures required for installing a solenoid valve.
07.15 Explain the procedures required for installing a thermostatic expansion valve.
07.16 Explain the procedures required for installing a liquid-line filter-dryer, suction-line filter-dryer and heat pump biflow.
07.17 Explain the procedures required for installing a check valve.
07.18 Explain the procedures required for installing a four-way reversing valve.
07.19 Understand procedures of installing electronic expansion valve.

10.0 DEMONSTRATE A WORKING KNOWLEDGE OF EVAPORATORS, COMPRESSORS, CONDENSERS AND METERING DEVICES--The student will be able to:

10.01 Explain the operation and use of bare-tube evaporators.
10.02 Explain the operation and use of finned evaporators.
10.03 Explain the operation and use of plate evaporators.
10.04 Explain the operation and use of unit cooler evaporators.
10.05 Explain the operation and use of a hermetic compressor.
10.06 Explain the operation of an open type compressor.
10.07 Explain the operation of a semi-hermetic type compressor.
10.08 Explain the methods of compression.
10.09 Analyze the operating condition of a compressor.
10.10 Explain the operation and use of air cooled condensers.
10.11 Explain the operation and use of water cooled condensers.
10.12 Explain the operation and use of a water tower.
10.13 Describe the maintenance required of a water cooled system.
10.14 Explain the operation and performance of a condenser.
10.15 Define capillary tubes.
10.16 Define TXV (thermostat expansion valve).
10.17 Explain the operation of fixed orifice devices.

11.0 DEMONSTRATE A WORKING KNOWLEDGE OF ACCESSORIES--The student will be able to:

11.01 Identify and explain location and use of receivers.
11.02 Identify and explain location and use of driers/filters.
11.03 Identify and explain location and use of solenoid valves.
11.04 Identify and explain location and use of heat exchangers.

11.05 Identify and explain location and use of humidifiers.
11.06 Explain the operations of front seat, mid position and back.
11.07 Identify and explain location and use of the condensate pump.
11.08 Identify and explain location and use of a check valve.
11.09 Identify and explain the operation of access valves.

12.0 DEMONSTRATE A WORKING KNOWLEDGE OF MECHANICAL/ELECTRONIC FILTRATION AND AIR HANDLING FANS--The student will be able to:

12.01 Identify and explain location and use of disposable mechanical filters.
12.02 Identify and explain location and use of permanent foam, mesh and fiber mechanical filters.
12.03 Identify and know location and use of high efficiency mechanical filters.
12.04 Describe and troubleshoot the operation of electronic air cleaners.
12.05 Identify and maintain centrifugal and axial fans.
12.06 Remove and replace centrifugal and axial fans.
12.07 Determine the proper direction of rotation on centrifugal and axial fans.
12.08 Adjust v-belt tension.
12.09 Determine wear and alignment of pulleys.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Air Conditioning, Refrigeration, Heating Mechanics

PROGRAM NUMBER: 8703000

COURSE TITLE: Air Conditioning, Refrigeration, and Heating Mechanics 5

COURSE NUMBER: 8703050

COURSE DESCRIPTION:

This course is designed to provide instruction in codes and standards, and air conditioning installation and start-up.

13.0 DEMONSTRATE A WORKING KNOWLEDGE OF CODES AND STANDARDS--The student will be able to:

13.01 Describe the reason for codes.
13.02 Discuss local codes.
13.03 Discuss standard codes.
13.04 Discuss uniform codes.
13.05 Identify codes and standards for the applicable area, locality or state.
13.06 Explain the relationship between codes and manufacturers' installation instructions.
13.07 Identify the purposes of the Air Cond. & Refrig. Inst., American Soc. of Heating, Refrig. & Air Cond. Engnrs & Sheet Metal Air Cond. Contractors Natl. Assoc.

15.0 DEMONSTRATE A WORKING KNOWLEDGE IN AIR CONDITIONING START-UP AND SERVICE PROBLEM ANALYSIS--The student will be able to:

15.01 Install an air conditioning system to manufacturers' installation and operation requirements.

15.02 Determine equipment electrical requirements.
15.03 Identify and use proper safety procedures when using tools and test equipment.
15.04 Explain local codes and ordinances.
15.05 Determine the temperature drop across the evaporator.
15.06 Determine the temperature rise across the condenser.
15.07 Determine proper charge in a residential air conditioning unit and measure superheat.
15.08 Read and comply with dispatch orders.
15.09 Write service report.
15.10 Apply good customer relations in classroom simulation.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Air Conditioning, Refrigeration, Heating Mechanics
PROGRAM NUMBER: 8703000

COURSE TITLE: Air Conditioning, Refrigeration, and Heating Mechanics 6
COURSE NUMBER: 8703060

COURSE DESCRIPTION:

This course is designed to provide instruction in heating system installation and start-up.

14.0 DEMONSTRATE A WORKING KNOWLEDGE IN HEATING START-UP, CHECKOUT AND OPERATION--The student will be able to:

14.01 Describe combustion theory.
14.02 Install a combustion heating unit to manufacturers' installation and operation requirements.
14.03 Determine the equipment electrical requirements.
14.04 Select and use appropriate tools and instruments.
14.05 Explain local codes and ordinances.
14.06 Apply good customer relations in classroom simulation.
14.07 Identify and explain air to air heat pump systems.
14.08 Identify and explain water to air heat pump systems.
14.09 Identify and explain water to water heat pump systems.
14.10 Identify and explain air to ground heat pump systems.
14.11 Identify and explain open loop heat pump systems.
14.12 Identify and explain closed loop heat pump systems.
14.13 Use tools and test equipment properly.
14.14 Determine equipment electrical requirements.
14.15 Determine the temperature drop across the outdoor coil on a heat pump.
14.16 Determine the temperature rise across the indoor coil on a heat pump.
14.17 Test for proper refrigerant charge in a residential heat pump.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Service Technology

CODE NUMBER: Secondary _______ Postsecondary I470201

Florida CIP 0647.020100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AC HEAT ME @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as heating, air conditioning and refrigeration mechanics (85902646), air conditioning installer-servicers (637.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; planning, installation, testing and servicing of air conditioning, refrigeration and heating systems and components; servicing, installation and troubleshooting electrical and mechanical components; testing, diagramming and solving problems in air conditioning, refrigeration and heating equipment; recordkeeping; basic supervisory skills; use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use specialized tools and equipment, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 8.0, Reading 9.0. This grade level number

corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Know the history/concepts of refrigeration and air conditioning.
02. Demonstrate a working knowledge of matter and heat behavior.
03. Demonstrate a working knowledge of fluids, pressures and refrigerants.
04. Demonstrate safe working practices and procedures.
05. Demonstrate appropriate use of tools and accessories.
06. Utilize and operate refrigeration-servicing and testing equipment.
07. Demonstrate a working knowledge in the use of piping, tubing and fittings used in VACR.
08. Demonstrate a working knowledge in basic electricity and electrical components.
09. Demonstrate a working knowledge in residential control system heating/cooling.
10. Demonstrate a working knowledge of evaporators, compressors, condensers and metering devices.
11. Demonstrate a working knowledge of accessories.
12. Demonstrate a working knowledge of mechanical/electronic filtration and air handling fans.
13. Demonstrate a working knowledge of codes and standards.
14. Demonstrate a working knowledge in heating start-up, checkout and operation.
15. Demonstrate a working knowledge in air conditioning start-up and service problem analysis.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Service Technology POSTSECONDARY NUMBER: I470201

01.0 KNOW THE HISTORY/CONCEPTS OF REFRIGERATION AND AIR CONDITIONING--The student will be able to:

01.01 Identify the four major refrigeration components.
01.02 Identify the high and low sides of the system.
01.03 Define the difference between air conditioning and refrigeration.
01.04 Differentiate between 'split systems' and 'package systems'.
01.05 Describe the benefits of conditioned air.
01.06 Describe some of today's current issues regarding air conditioning--industry concerns and future ramifications.

02.0 DEMONSTRATE A WORKING KNOWLEDGE OF MATTER AND HEAT BEHAVIOR--The student will be able to:

02.01 Describe matter and heat.
02.02 Distinguish between the three states of matter.
02.03 Describe the direction of heat flow.
02.04 Describe the three methods of heat transfer.
02.05 Describe the boiling/saturation and superheat/subcooling points.
02.06 Describe the freezing point.
02.07 Describe critical temperature.
02.08 Describe absolute zero.
02.09 Describe the difference between heat and temperature.
02.10 Describe the difference between latent and sensible heat.

03.0 DEMONSTRATE A WORKING KNOWLEDGE OF FLUIDS, PRESSURES AND REFRIGERANTS--The student will be able to:

03.01 Define pressures and fluids.
03.02 Calculate absolute and gauge pressures.
03.03 Measure absolute and gauge pressures.
03.04 Explain how fluids react in a closed vs. open system.
03.05 Compare temperatures and pressures (P/T Chart).
03.06 Explain how fluids flow.
03.07 Define the properties of refrigerants.
03.08 Describe the uses for different refrigerants.
03.09 Define 'color-coding' of cylinders.
03.10 Explain classifications of refrigerants.
03.11 List proper methods of transfer and storage.
03.12 Trace the refrigeration cycle.
03.13 Describe the benefits of superheat and subcooling.
03.14 Explain the effects of improper refrigerant in a system.

04.0 DEMONSTRATE SAFE WORKING PRACTICES AND PROCEDURES-- The student will be able to:
04.01 Identify and use good housekeeping practices in the laboratory.
04.02 Describe the reasons for regular safety meetings.
04.03 Explain the reasons for company safety policies.
04.04 Explain and follow OSHA standards.
04.05 Explain the need for employee background checks and medical examinations.
04.06 Identify and use appropriate personal safety equipment.
04.07 Identify and use proper fire extinguishers and other such safety devices.
04.08 Identify and use emergency first aid procedures.

04.09 Identify and use safe handling practices as they relate to hazardous and volatile fluids.
04.10 Apply specific safety practices as they relate to contaminated refrigerants.
04.11 Apply specific safety and recovery practices as they relate to chlorofluorocarbons.
04.12 Apply specific safety practices as they relate to handling and storing cylinders.
04.13 Select and wear proper protective clothing and equipment.
04.14 Identify and use proper tools/materials for the job.
04.15 Identify and use specific safety practices when soldering and brazing.
04.16 Identify and use OSHA safety practices when removing charging lines, to prevent frostbite.
04.17 Identify and use OSHA safety practices while handling ladders.
04.18 Identify and use OSHA safety practices when using guardrails.
04.19 Identify when and where to weld.
04.20 Identify and use OSHA safety practices when working near moving equipment.
04.21 Identify correct locations and procedures for hanging fire extinguishers.
04.22 Identify and use OSHA safety practices relating to a ground fault circuit interrupter.
04.23 Identify and use OSHA safety practices relating to frayed cords.
04.24 Identify and use OSHA safety practices as they relate to the length and size of the extension cord.
04.25 Identify and practice OSHA safety procedures when working with electricity around water.
04.26 Define and use safety procedures when working with gases and combustibles.

05.0 DEMONSTRATE APPROPRIATE USE OF TOOLS AND ACCESSORIES--The student will be able to:
05.01 Identify and use basic tools and accessories.
05.02 Identify and use power tools.
05.03 Identify and use fasteners.
05.04 Identify and use pipe and tubing tools.
05.05 Describe and apply appropriate maintenance processes for tools and accessories.
05.06 Identify and use specialized tools of the trade.

06.0 UTILIZE AND OPERATE REFRIGERATION-SERVICING AND TESTING EQUIPMENT--The student will be able to:

06.01 Measure pressures with the refrigeration gauge manifold.
06.02 Evacuate system with a two stage vacuum pump.
06.03 Measure temperatures with bimetal and electronic thermometers.
06.04 Check for refrigeration leaks with electronic, halogen, torch and liquid leak detector.
06.05 Charge air conditioning/refrigeration systems with vapor in low side.
06.06 Charge air conditioning/refrigeration system with liquid in high side.

07.0 DEMONSTRATE A WORKING KNOWLEDGE IN THE USE OF PIPING, TUBING AND RELATED COMPONENTS--The student will be able to:

07.01 Identify, install and leak test types of pipe, tubing and fittings used in HVACR.
07.02 Identify and use soldering and brazing alloys used in HVACR.
07.03 Select and use appropriate soldering and brazing alloys.
07.04 Connect tubing using flared fittings.
07.05 Connect tubing using compression fittings.
07.06 Connect copper tubing using a swaged joint.
07.07 Bend copper tubing using tube benders.

07.08 Identify and use types of torches.
07.09 Solder and braze copper tubing.
07.10 Silver braze brass and steel fitting to copper tubing.
07.11 Connect aluminum tubing using solderless connector.
07.12 Understand procedures of installing pipe and tubing insulation.
07.13 Explain the procedures required for installing a sweat sight glass.
07.14 Explain the procedures required for installing a solenoid valve.
07.15 Explain the procedures required for installing a thermostatic expansion valve.
07.16 Explain the procedures required for installing a liquid-line filter-dryer, suction-line filter-dryer and heat pump biflow.
07.17 Explain the procedures required for installing a check valve.
07.18 Explain the procedures required for installing a four-way reversing valve.
07.19 Understand procedures of installing electronic expansion valve.

08.0 DEMONSTRATE A WORKING KNOWLEDGE IN BASIC ELECTRICITY AND ELECTRICAL COMPONENTS--The student will be able to:

08.01 Explain how electricity is produced.
08.02 Define watts, ohms, volts and amps.
08.03 Identify and use appropriate procedures to troubleshoot fuses and breakers.
08.04 Measure wattage, resistance, voltage and amperage using appropriate meter.
08.05 Troubleshoot and explain the function of relays.
08.06 Troubleshoot and explain the function of contactors.
08.07 Troubleshoot and explain the function of a capacitor.
08.08 Troubleshoot and explain the function of a defrost timer.
08.09 Troubleshoot and explain the function of a crankcase heater.
08.10 Troubleshoot and explain the function of water valves.
08.11 Troubleshoot and explain the function of thermostats.

9.0 DEMONSTRATE A WORKING KNOWLEDGE IN RESIDENTIAL CONTROL SYSTEM HEATING/COOLING--The student will be able to:

09.01 Draw and apply a schematic wiring diagram of a low voltage control system.
09.02 Wire a complete heating/cooling system, line and low voltage.
09.03 Connect field control wiring on heat pump installation.
09.04 Identify and troubleshoot controls for heating and cooling systems.
09.05 Interpret and apply a schematic wiring diagram of a low voltage control system.
09.06 Adjust heat anticipator on thermostat.
09.07 Identify, install and troubleshoot a single stage heat and single stage cool thermostat.
09.08 Identify, install and troubleshoot a two stage hat and two stage cool thermostat.
09.09 Analyze electronic circuit containing power source, control card, sensor and control device.
09.10 Explain basic heat pump, electrical and mechanical operations.
09.11 Explain the operation of a reversing valve.
09.12 Describe the purpose and function of outdoor thermostats.
09.13 Explain the operation of defrost controls.
09.14 Explain the operation of auxiliary heat.
09.15 Connect a single-phase motor.
09.16 Reverse rotation of single-phase motor.
09.17 Connect three-phase motor.
09.18 Correct the causes of electrical problems.
09.19 Identify and correct the causes of mechanical problems.

10.0 DEMONSTRATE A WORKING KNOWLEDGE OF EVAPORATORS, COMPRESSORS, CONDENSERS AND

METERING DEVICES--The student will be able to:

10.01 Explain the operation and use of bare-tube evaporators.
10.02 Explain the operation and use of finned evaporators.
10.03 Explain the operation and use of plate evaporators.
10.04 Explain the operation and use of unit cooler evaporators.
10.05 Explain the operation and use of a hermetic compressor.
10.06 Explain the operation of an open type compressor.
10.07 Explain the operation of a semi-hermetic type compressor.
10.08 Explain the methods of compression.
10.09 Analyze the operating condition of a compressor.
10.10 Explain the operation and use of air cooled condensers.
10.11 Explain the operation and use of water cooled condensers.
10.12 Explain the operation and use of a water tower.
10.13 Describe the maintenance required of a water cooled system.
10.14 Explain the operation and performance of a condenser.
10.15 Define capillary tubes.
10.16 Define TXV (thermostat expansion valve).
10.17 Explain the operation of fixed orifice devices.

11.0 DEMONSTRATE A WORKING KNOWLEDGE OF ACCESSORIES--The student will be able to:

11.01 Identify and explain location and use of receivers.
11.02 Identify and explain location and use of driers/filters.
11.03 Identify and explain location and use of solenoid valves.
11.04 Identify and explain location and use of heat exchangers.
11.05 Identify and explain location and use of humidifiers.
11.06 Explain the operations of front seat, mid position and back.
11.07 Identify and explain location and use of the condensate pump.
11.08 Identify and explain location and use of a check valve.
11.09 Identify and explain the operation of access valves.

12.0 DEMONSTRATE A WORKING KNOWLEDGE OF MECHANICAL/ELECTRONIC FILTRATION AND AIR HANDLING FANS--The student will be able to:

12.01 Identify and explain location and use of disposable mechanical filters.
12.02 Identify and explain location and use of permanent foam, mesh and fiber mechanical filters.
12.03 Identify and know location and use of high efficiency mechanical filters.
12.04 Describe and troubleshoot the operation of electronic air cleaners.
12.05 Identify and maintain centrifugal and axial fans.
12.06 Remove and replace centrifugal and axial fans.
12.07 Determine the proper direction of rotation on centrifugal and axial fans.
12.08 Adjust v-belt tension.
12.09 Determine wear and alignment of pulleys.

13.0 DEMONSTRATE A WORKING KNOWLEDGE OF CODES AND STANDARDS--The student will be able to:

13.01 Describe the reason for codes.
13.02 Discuss local codes.
13.03 Discuss standard codes.
13.04 Discuss uniform codes.
13.05 Identify codes and standards for the applicable area, locality or state.
13.06 Explain the relationship between codes and manufacturers' installation instructions.
13.07 Identify the purposes of the Air Cond. & Refrig. Inst., American Soc. of Heating, Refrig. & Air Cond. Engnrs & Sheet Metal Air Cond. Contractors Natl. Assoc.

14.0 DEMONSTRATE A WORKING KNOWLEDGE IN HEATING START-UP, CHECKOUT AND OPERATION--The student will be able to:

14.01 Describe combustion theory.
14.02 Install a combustion heating unit to manufacturers' installation and operation requirements.
14.03 Determine the equipment electrical requirements.
14.04 Select and use appropriate tools and instruments.
14.05 Explain local codes and ordinances.
14.06 Apply good customer relations in classroom simulation.
14.07 Identify and explain air to air heat pump systems.
14.08 Identify and explain water to air heat pump systems.
14.09 Identify and explain water to water heat pump systems.
14.10 Identify and explain air to ground heat pump systems.
14.11 Identify and explain open loop heat pump systems.
14.12 Identify and explain closed loop heat pump systems.
14.13 Use tools and test equipment properly.
14.14 Determine equipment electrical requirements.
14.15 Determine the temperature drop across the outdoor coil on a heat pump.
14.16 Determine the temperature rise across the indoor coil on a heat pump.
14.17 Test for proper refrigerant charge in a residential heat pump.

15.0 DEMONSTRATE A WORKING KNOWLEDGE IN AIR CONDITIONING START-UP AND SERVICE PROBLEM ANALYSIS--The student will be able to:

15.01 Install an air conditioning system to manufacturers' installation and operation requirements.
15.02 Determine equipment electrical requirements.
15.03 Identify and use proper safety procedures when using tools and test equipment.
15.04 Explain local codes and ordinances.
15.05 Determine the temperature drop across the evaporator.
15.06 Determine the temperature rise across the condenser.
15.07 Determine proper charge in a residential air conditioning unit and measure superheat.
15.08 Read and comply with dispatch orders.
15.09 Write service report.
15.10 Apply good customer relations in classroom simulation.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:
16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competency in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify and adopt acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.

17.06 Identify the business skills needed to operate a small business efficiently and effectively.
17.07 Demonstrate knowledge of state licensing requirements.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Systems Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.050100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other ___

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as heating, air conditioning, refrigeration mechanics (85902646), air conditioning and heating technicians (007.181-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, and safe and efficient work practices. The program prepares students to assist in engineering departments or work independently, capable of designing, installing, maintaining and operating small or medium air conditioning, heating or refrigerating systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in design and fabrication of piping, design, install and service controls and components, electrical wiring diagrams, troubleshoot electrical and mechanical systems, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation procedures.
02. Apply basic air conditioning and refrigeration skills.
03. Apply tubing piping, soldering and brazing skills.
04. Apply basic refrigeration fundamentals skills.
05. Apply basic electrical skills.
06. Install and service air conditioning and refrigeration electrical systems.
07. Install, maintain and repair residential air conditioning systems.
08. Install, maintain and repair commercial air conditioning systems.
09. Install, maintain and repair commercial refrigeration systems.
10. Install, maintain and repair heating systems.
11. Apply basic heat gain, heat loss and design skills.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: ____________

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Systems Technology
POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION PRACTICES--The student will be able to:

01.01 Demonstrate understanding of school and shop policies.
01.02 Complete course administrative forms and activities.

02.0 APPLY BASIC AIR CONDITIONING AND REFRIGERATION SKILLS--the student will be able to:

02.01 Apply safety practices.
02.02 Apply basic mathematics skills.
02.03 Apply recordkeeping skills.
02.04 Install and service tubing and fittings.
02.05 Install and service pipe and fittings.
02.06 Identify and use hand and power tools.
02.07 Identify and use specialized tools.
02.08 Write job specifications.
02.09 Read blueprints and mechanical drawings.
02.10 Prepare, analyze, and evaluate technical reports and data.

03.0 APPLY TUBING, PIPING, SOLDERING AND BRAZING SKILLS--The student will be able to:

03.01 Install and service tubing and fittings.
03.02 Install and service pipe and fittings.
03.03 Use soft soldering practices.
03.04 Use brazing practices.

04.0 APPLY BASIC REFRIGERATION FUNDAMENTALS SKILLS--The student will be able to:

04.01 Apply basic refrigeration safety practices.
04.02 Identify basic refrigeration cycle.
04.03 Compare refrigerant pressure to temperature relationships.
04.04 Identify and service refrigeration system and components.
04.05 Apply dehydration and evacuation procedures.
04.06 Service and charge a basic refrigeration system.
04.07 Locate and repair refrigeration system leaks.
04.08 Test, analyze and replace compressors.
04.09 Apply troubleshooting techniques for refrigeration systems.
04.10 Design basic refrigeration.

05.0 APPLY BASIC ELECTRICAL SKILLS--The student will be able to:

05.01 Apply basic electrical safety practices.
05.02 Identify the nature of electricity.
05.03 Identify magnetism and electromagnetism induction.
05.04 Identify electrical components symbols and diagrams.
05.05 Apply basic electrical theory and calculations.
05.06 Calculate and measure electrical valves in series and parallel circuits.
05.07 Compare alternating to direct current.
05.08 Test electrical components.
05.09 Test single and three phase motors.
05.10 Test capacitors.

05.11 Test solid state components
05.12 Troubleshoot/diagnose electrical circuits.
05.13 Read schematics and diagrams.
05.14 Design electrical systems.

06.0 INSTALL AND SERVICE AIR CONDITIONING AND REFRIGERATION ELECTRICAL SYSTEMS--The student will be able to:

06.01 Install and service electrical components.
06.02 Install and service electrical controls.
06.03 Troubleshoot/diagnose electrical components and controls.
06.04 Test, analyze, remove and replace single phase motors.
06.05 Test, analyze, remove and replace three phase motors.
06.06 Test, analyze, remove and replace thermostatic controls.

07.0 INSTALL, MAINTAIN AND REPAIR RESIDENTIAL AIR CONDITIONING SYSTEMS--The student will be able to:

07.01 Install, test, analyze and repair air to air systems.
07.02 Install, test, analyze and repair water to air systems.
07.03 Install, test, analyze and repair heat pump systems.
07.04 Test and analyze air movement systems.
07.05 Apply local and national codes.
07.06 Design, construct, install and service comfort systems.
07.07 Calculate job cost estimates.

08.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL AIR CONDITIONING SYSTEMS--The student will be able to:

08.01 Install, test, analyze and repair air to air systems.
08.02 Install, test, analyze and repair water to air systems.
08.03 Install, test, analyze and repair heat pump systems.
08.04 Install, test, analyze and repair chiller systems.
08.05 Test and analyze air movement systems.
08.06 Apply local and national codes.
08.07 Install, service and repair cooling towers.
08.08 Install, service and repair water cooled condensers.
08.09 Install, service and repair water treatment systems.
08.10 Apply accepted industry pipe sizing and installation procedures.
08.11 Calculate, design and layout environmental systems.
08.12 Calculate job cost estimates.

09.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL REFRIGERATION SYSTEMS--The student will be able to:

09.01 Install, test, analyze and adjust refrigerant pressure regulating devices.
09.02 Test, analyze and replace electrical controls and components.
09.03 Test, analyze and replace defrost systems.
09.04 Test, analyze and replace pump down systems.
09.05 Use various refrigeration equipment electrical diagrams.
09.06 Apply industry accepted piping installation procedures.
09.07 Apply industry pipe sizing standards.
09.08 Install, service and repair ice machines and specialty systems.
09.09 Apply local and national codes.
09.10 Calculate loads, design and layout refrigeration.
09.11 Calculate job cost estimates.

10.0 INSTALL, MAINTAIN AND REPAIR HEATING SYSTEMS--The student will be able to:

10.01 Install, service and repair a gas furnace.

10.02 Install, service and repair an oil furnace.
10.03 Install, service and repair electric furnace.
10.04 Install, service and repair duct heaters.
10.05 Install, service and repair auxiliary heat strips.
10.06 Design, install, service and repair solar heating systems.
10.07 Install, service and repair miscellaneous heating equipment.
10.08 Apply local and national codes.
10.09 Install, service and repair hydronic systems.
10.10 Test and analyze heating air movement systems.
10.11 Calculate loads, design and layout heating systems.
10.12 Calculate job cost estimates.

11.0 DEMONSTRATE BASIC HEAT GAIN, HEAT LOSS AND DESIGN SKILLS--The student will be able to:

11.01 Calculate heating and cooling requirements from specifications.
11.02 Calculate and design air distribution systems.
11.03 Determine air properties by use of psychrometerics.
11.04 Calculate cooling and heating equipment sizes.
11.05 Design, construct and install air movement systems.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Air Traffic Control

CODE NUMBER: Secondary _______   Postsecondary I490105

Florida CIP 0649.010500

SECONDARY SCHOOL CREDITS ___   COLLEGE CREDITS ___   POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9   ___9-12   x Postsecondary Adult Vocational

___Postsecondary Vocational   x Other 30,31

CERTIFICATION COVERAGE: AIR CONT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as air traffic controllers (39002241), air traffic control specialists (193.162-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Administration regulations, air traffic control procedures, aviation safety, flight psychology, meteorology, navigation and communications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in aircraft guidance systems and aircraft flight control systems in simulations and actual air traffic control environments.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Students must meet physical and psychological standards required by the Federal Aviation Administration.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of fundamentals of aeronautics.
02. Solve basic navigation situations.
03. Demonstrate an understanding of federal flight rules and regulations.
04. Develop an understanding of meteorology.
05. Interpret Federal Aviation Administration enroute and terminal charts and rules.
06. Demonstrate knowledge and understanding of aircraft engines and systems.
07. Demonstrate an understanding of aviation safety.
08. Demonstrate an understanding of aviation law.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Air Traffic Control POSTSECONDARY NUMBER: I490105

01.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

01.01 Differentiate between aeronautics and aerodynamics.
01.02 State and give examples of Newton's three laws of motion.
01.03 Name and compare the four forces of flight.
01.04 Describe an airfoil.
01.05 State how lift is produced.
01.06 Discuss how and why an airplane stalls.
01.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
01.08 Explain the magnetic compass.

02.0 SOLVE BASIC NAVIGATION SITUATIONS--The student will be able to:

02.01 Define radio navigation and be able to explain VOR and loran principles.
02.02 Define great circle, meridian, longitude, latitude and conic projection.
02.03 Explain and understand the sectional charts used in aviation.
02.04 Explain VOR navigation, radar, DME and RNAV principles.
02.05 Define radial, bearing, tacan, MEA, ASR, IFR, VFR and holding pattern.

03.0 DEMONSTRATE AN UNDERSTANDING OF FEDERAL FLIGHT RULES AND REGULATIONS--The student will be able to:

03.01 Explain major portion of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.

04.0 DEVELOP AN UNDERSTANDING OF METEOROLOGY--The student will be able to:

04.01 State the correct names of the major civilian and military weather organizations.
04.02 Explain why the military needs its own weather service.
04.03 Name and state the function of at least three instruments meteorologists use in gathering weather data.
04.04 Name and describe two types of weather satellites.
04.05 Interpret weather surface charts, station sequence reports, terminal reports and area forecasts.
04.06 Analyze and predict weather using meteorology charts, maps and reports.

05.0 INTERPRET FEDERAL AVIATION ADMINISTRATION ENROUTE AND TERMINAL CHARTS AND RULES--The student will be able to:

05.01 Explain enroute charts and their legend.
05.02 Explain terminal charts and understand the legend.
05.03 Understand the parts 61, 91 of the Federal Aviation Regulations.

06.0 DEMONSTRATE KNOWLEDGE AND UNDERSTANDING OF AIRCRAFT ENGINES AND SYSTEMS--The student will be able to:

06.01 Identify and describe the parts of a reciprocating engine.
06.02 Understand the difference between reciprocating engines and the

jet engine.
06.03 Define turbine and ramjet principles.
06.04 Explain the electrical and hydraulic systems on small aircraft.

07.0 DEMONSTRATE AN UNDERSTANDING OF AVIATION SAFETY--The student will be able to:

07.01 Explain dangerous areas around jet aircraft, large propeller driven aircraft and around small general aviation aircraft.
07.02 Identify dangerous weather conditions.
07.03 Differentiate between various causes of airsickness.
07.04 Explain the ATC system as it operates today and the safety aspects.
07.05 Define hypoxia and hyperventilation and list the causes of each.

08.0 DEMONSTRATE AN UNDERSTANDING OF AVIATION LAW--The student will be able to:

08.01 Explain and define liability, pilot in command, owner and other terms used in aviation law.
08.02 Explain the differences between civil and military law as it relates to aviation.
08.03 List and describe the agencies both federal and international that affect aviation laws and regulations.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

13.01 Identify characteristics of the American enterprise system.
13.02 Define inflation and deflation.
13.03 Illustrate the basic economic questions facing any society.
13.04 Determine the results of a change in demand or a change in supply.
13.05 List factors which contribute to economic growth.
13.06 Identify characteristics of different types of business ownership.
13.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aircraft Airframe Mechanics

CODE NUMBER: Secondary ______ Postsecondary I470612

Florida CIP 0647.060700

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30-31

CERTIFICATION COVERAGE: AIR MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as aircraft structure assemblers (93102675), aircraft body repairers (807.261-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) airframe license examinations for aviation maintenance airframe technician certification.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: practical hands-on experiences using the tools and equipment appropriate to the program content and in accordance with current practices in the trade.

III. SPECIAL NOTE: A student may elect to progress from Airframe Mechanic subjects into Power Plant Mechanic subjects without repeating the General Aviation skills. Upon completion of both the Airframe and the Power Plant competencies, the student will qualify as an Airframe and Power Plant (A and P) Mechanic.

The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading, 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated

basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1320 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic electricity skills.
02. Perform basic aircraft drawing skills.
03. Demonstrate aircraft weight and balance skills.
04. Maintain aircraft fluid lines and fittings.
05. Perform aircraft materials and process skills.
06. Perform ground operations and servicing duties.
07. Perform cleaning and corrosion control operations.
08. Demonstrate mathematical skills.
09. Maintain maintenance forms and records.
10. Apply basic physics to airframe systems.
11. Demonstrate the use of maintenance publications.
12. Interpret mechanic privileges.
13. Maintain wood structures.
14. Perform aircraft covering.
15. Apply aircraft finishes.
16. Repair sheetmetal structures.
17. Perform welding.
18. Perform assembly and rigging.
19. Perform airframe inspection.
20. Maintain aircraft landing gear systems.
21. Maintain hydraulic and pneumatic power systems.
22. Maintain cabin atmosphere control systems.
23. Maintain aircraft instrument systems.
24. Maintain communication and navigation systems.
25. Inspect and repair aircraft fuel systems.
26. Inspect and repair aircraft electrical systems.
27. Inspect and repair position and warning systems.
28. Maintain ice and rain control systems.
29. Inspect and repair aircraft fire protection systems.
30. Demonstrate knowledge of Federal Aviation Administration Airframe licensing requirements.
31. Demonstrate appropriate communication skills.
32. Demonstrate appropriate math skills.
33. Demonstrate appropriate understanding of basic science.
34. Demonstrate employability skills.
35. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ______

PROGRAM TITLE: Aircraft Airframe Mechanics PROGRAM NUMBER: I470612

01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:

01.01 Measure capacitance and inductance.
01.02 Calculate and measure electrical power.
01.03 Measure voltage, current, resistance, continuity and leakage.
01.04 Determine the relationship of voltage, current and resistance in electrical circuits.
01.05 Read and interpret electrical circuit diagrams.
01.06 Inspect and service batteries.
01.07 Utilize proper electrical safety procedures.

02.0 PERFORM BASIC AIRCRAFT DRAWING SKILLS--The student will be able to:

02.01 Use drawings, symbols and schematic diagrams.
02.02 Draw sketches of repairs and alterations.
02.03 Use blueprint information.
02.04 Use graphs and charts.

03.0 DEMONSTRATE AIRCRAFT WEIGHT AND BALANCE SKILLS--The student will be able to:

03.01 Weigh aircraft.
03.02 Perform complete weight and balance check and record data.
03.03 Utilize proper personal safety procedures.

04.0 MAINTAIN AIRCRAFT FLUID LINES AND FITTINGS--The student will be able to:

04.01 Fabricate and install rigid and flexible fluid lines and fittings.
04.02 Identify and utilize special fluid line tools.

05.0 PERFORM AIRCRAFT MATERIALS AND PROCESSES SKILLS--The student will be able to:

05.01 Identify and select appropriate nondestructive testing methods.
05.02 Perform penetrant, chemical etching and magnetic particle inspections.
05.03 Perform basic heat-treating processes.
05.04 Identify and select aircraft hardware and materials.
05.05 Inspect and check welds.
05.06 Perform precision measurements.
05.07 Perform safety wiring techniques.

06.0 PERFORM GROUND OPERATIONS AND SERVICING DUTIES--The student will be able to:

06.01 Start, ground operate, move, service and secure aircraft.
06.02 Identify and select fuels.
06.03 Comply with prescribed shop and personal safety procedures.

07.0 PERFORM CLEANING AND CORROSION CONTROL OPERATIONS--The student will be able to:

07.01 Identify and select cleaning materials.
07.02 Perform aircraft cleaning and corrosion control.
07.03 Identify and utilize appropriate equipment for cleaning and

corrosion control.
07.04 Observe appropriate personal safety procedures for corrosive chemicals.

08.0 DEMONSTRATE MATHEMATICAL SKILLS--The student will be able to:

08.01 Extract roots and raise numbers to a given power.
08.02 Determine areas and volumes of various geometrical shapes.
08.03 Solve ratio, proportion and percentage problems.
08.04 Perform algebraic operations.

09.0 MAINTAIN MAINTENANCE FORMS AND RECORDS--The student will be able to:

09.01 Write descriptions of aircraft condition and work performed.
09.02 Complete required maintenance forms, records and inspection reports.

10.0 APPLY BASIC PHYSICS TO AIRFRAME SYSTEMS--The student will be able to:

10.01 Use the principles of simple machines, sound, fluid and heat dynamics.

11.0 DEMONSTRATE USE OF MAINTENANCE PUBLICATIONS--The student will be able to:

11.01 Select and use FAA and manufacturer's aircraft maintenance specifications, data sheets, manuals and publications and related Federal Aviation Regulations.
11.02 Read technical data.

12.0 INTERPRET MECHANIC PRIVILEGES --The student will be able to:

12.01 Exercise mechanic privileges within the limitations prescribed by FAR Part 65.
12.02 Comply with prescribed shop and personal safety procedures.

13.0 MAINTAIN WOOD STRUCTURES--The student will be able to:

13.01 Service and repair wood structures.
13.02 Identify wood defects.
13.03 Inspect wood structures.

14.0 PERFORM AIRCRAFT COVERING--The student will be able to:

14.01 Select and apply fabric and fiberglass covering materials.
14.02 Inspect, test and repair fabric and fiberglass.

15.0 APPLY AIRCRAFT FINISHES--The student will be able to:

15.01 Apply trim, letters and touchup paint.
15.02 Identify and select aircraft finishing materials.
15.03 Apply paint and dope.
15.04 Inspect finishes and identify defects.

16.0 REPAIR SHEET METAL STRUCTURES--The student will be able to:

16.01 Install special rivets and fasteners.
16.02 Inspect bonded structures.
16.03 Inspect and repair plastics, honeycomb and laminated structures.
16.04 Inspect, check, service and repair windows, doors and interior furnishings.
16.05 Inspect and repair sheet-metal structures.

16.06 Install conventional rivets.
16.07 Hand form, lay out and bend sheet metal.
16.08 Identify and utilize appropriate metalworking tools and equipment.

17.0 PERFORM WELDING--The student will be able to:

17.01 Weld magnesium and titanium.
17.02 Solder stainless steel.
17.03 Fabricate tubular structures.
17.04 Solder, braze, gas-weld and arc-weld steel.
17.05 Weld aluminum and stainless steel.
17.06 Identify and utilize appropriate welding tools and equipment.

18.0 PERFORM ASSEMBLY AND RIGGING--The student will be able to:

18.01 Rig rotary-wing aircraft.
18.02 Rig fixed-wing aircraft.
18.03 Check alignment of structures.
18.04 Assemble aircraft.
18.05 Balance and rig movable structures.
18.06 Jack aircraft.
18.07 Identify and utilize appropriate rigging tools and equipment.

19.0 PERFORM AIRFRAME INSPECTION--The student will be able to:

19.01 Perform conformity and airworthiness inspections.

20.0 MAINTAIN AIRCRAFT LANDING GEAR SYSTEMS--The student will be able to:

20.01 Inspect, check, service and repair landing gear retraction systems, shock struts, brakes, wheels, tires and steering systems.

21.0 MAINTAIN HYDRAULIC AND PNEUMATIC POWER SYSTEMS--The student will be able to:

21.01 Repair hydraulic and pneumatic power system components.
21.02 Identify and select hydraulic fluids.
21.03 Inspect and repair hydraulic and pneumatic power systems.
21.04 Identify and utilize appropriate hydraulic and pneumatic tools and equipment.

22.0 MAINTAIN CABIN ATMOSPHERE CONTROL SYSTEMS--The student will be able to:

22.01 Repair air conditioning, pressurization and oxygen system components.
22.02 Inspect and repair heating, air conditioning and pressurization systems.
22.03 Inspect, check, troubleshoot, service and repair oxygen systems.

23.0 MAINTAIN AIRCRAFT INSTRUMENT SYSTEMS--The student will be able to:

23.01 Install instruments.
23.02 Inspect and repair heading, speed, altitude, attitude and position systems.

24.0 MAINTAIN COMMUNICATION AND NAVIGATION SYSTEMS--The student will be able to:

24.01 Inspect, check and service auto-pilot and approach control systems.
24.02 Inspect, check and service electronic communication and navigation systems.

24.03 Inspect and repair antenna and electronic equipment installations.
24.04 Identify and utilize special electronic tools and equipment.

25.0 INSPECT AND REPAIR AIRCRAFT FUEL SYSTEMS--The student will be able to:

25.01 Check and service fuel dump systems.
25.02 Perform fuel management, transfer and de-fueling.
25.03 Inspect, check and repair pressure fuel systems.
25.04 Repair aircraft fuel system components.
25.05 Inspect and repair fluid quantity indicating systems.
25.06 Troubleshoot, service and repair fluid and temperature warning systems.
25.07 Inspect, check, service, troubleshoot and repair aircraft fuel systems.

26.0 INSPECT AND REPAIR AIRCRAFT ELECTRICAL SYSTEMS--The student will be able to:

26.01 Repair aircraft electrical system components.
26.02 Install and service electric indicators, protective devices, wiring and controls.
26.03 Inspect and repair AC and DC current electrical systems.
26.04 Identify and utilize appropriate electrical tools and equipment.

27.0 INSPECT AND REPAIR POSITION AND WARNING SYSTEMS--The student will be able to:

27.01 Inspect, check and service speed- and takeoff-warning systems, electrical brake controls and antiskid systems.
27.02 Inspect and repair landing gear and position indicating warning systems.

28.0 MAINTAIN ICE AND RAIN CONTROL SYSTEMS--The student will be able to:

28.01 Inspect, service and repair airframe ice and rain control systems.

29.0 INSPECT AND REPAIR AIRCRAFT FIRE PROTECTION SYSTEMS--The student will be able to:

29.01 Inspect, check and service smoke and carbon monoxide detection systems.
29.02 Inspect and repair fire detection and fire extinguishing systems.Aircraft Airframe Mechanics - Continued

30.0 DEMONSTRATE KNOWLEDGE OF FEDERAL AVIATION ADMINISTRATION AIRFRAME LICENSING REQUIREMENTS--The student will be able to:

30.01 Complete Federal Aviation Administration licensing examination.
30.02 Display Federal Aviation Administration airframe mechanics license.

31.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

31.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
31.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
31.03 Read and follow written and oral instructions.
31.04 Answer and ask questions coherently and concisely.
31.05 Read critically by recognizing assumptions and implications and by

evaluating ideas.
31.06 Demonstrate appropriate telephone/communication skills.

32.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

32.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
32.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
32.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
32.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
32.05 Demonstrate an understanding of federal, state and local taxes and their computation.

33.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

33.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
33.02 Draw conclusions or make inferences from data.
33.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
33.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

34.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

34.01 Conduct a job search.
34.02 Secure information about a job.
34.03 Identify documents which may be required when applying for a job interview.
34.04 Complete a job application form correctly.
34.05 Demonstrate competence in job interview techniques.
34.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
34.07 Identify acceptable work habits.
34.08 Demonstrate knowledge of how to make job changes appropriately.
34.09 Demonstrate acceptable employee health habits.
34.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

35.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

35.01 Define entrepreneurship.
35.02 Describe the importance of entrepreneurship to the American economy.
35.03 List the advantages and disadvantages of business ownership.
35.04 Identify the risks involved in ownership of a business.
35.05 Identify the necessary personal characteristics of a successful entrepreneur.
35.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aircraft Power Plant Mechanics

CODE NUMBER: Secondary _______ Postsecondary I470622

Florida CIP 0647.060800

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30-31

CERTIFICATION COVERAGE: AIR MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as aircraft mechanics (85323630), aircraft engine mechanics (621.281-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: Federal Aviation Regulations (FAR) part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) airframe license examinations for aviation maintenance power plant technician certification.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: practical hands-on experiences using the tools and equipment appropriate to the program content and in accordance with current practices in the trade.

III. SPECIAL NOTE: A student may elect to progress from Airframe Mechanic subjects into Power Plant Mechanic subjects without repeating the General Aviation skills. Upon completion of both the Airframe and Power Plant competencies, the student will qualify as an Airframe and Power (A and P) Mechanic.

The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading, 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1320 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic electricity skills.
02. Perform basic aircraft drawing skills.
03. Demonstrate aircraft weight and balance skills.
04. Maintain aircraft fluid lines and fittings.
05. Perform aircraft materials and process skills.
06. Perform ground operation and servicing duties.
07. Perform cleaning and corrosion control operations.
08. Demonstrate mathematical skills.
09. Maintain forms and records.
10. Apply basic physics to airframe systems.
11. Demonstrate the use of maintenance publications.
12. Interpret mechanic privileges.
13. Perform basic reciprocating engine skills.
14. Perform basic turbine engine skills.
15. Perform engine inspection.
16. Maintain engine instrument systems.
17. Maintain engine fire protection systems.
18. Maintain engine electrical systems.
19. Maintain lubrication systems.
20. Maintain ignition systems.
21. Maintain fuel metering systems.
22. Maintain engine fuel systems.
23. Maintain induction systems.
24. Maintain engine cooling systems.
25. Maintain engine exhaust systems.
26. Maintain aircraft propellers.
27. Demonstrate knowledge of FAA licensing requirements.
28. Demonstrate appropriate communication skills.
29. Demonstrate appropriate math skills.
30. Demonstrate appropriate understanding of basic science.
31. Demonstrate employability skills.
32. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Aircraft Power Plant Mechanics POSTSECONDARY NUMBER: I470622

01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:

01.01 Measure capacitance and inductance.
01.02 Calculate and measure electrical power
01.03 Measure voltage, current, resistance, continuity, and leakage.
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.
01.05 Read and interpret electrical circuit diagrams.
01.06 Inspect and service batteries.
01.07 Utilize proper electrical safety procedures.

02.0 PERFORM BASIC AIRCRAFT DRAWING SKILLS--The student will be able to:

02.01 Use drawings, symbols, and schematic diagrams.
02.02 Draw sketches of repairs and alterations.
02.03 Use blueprint information.
02.04 Use graphs and charts.

03.0 DEMONSTRATE AIRCRAFT WEIGHT AND BALANCE SKILLS--The student will be able to:

03.01 Weigh aircraft.
03.02 Perform complete weight and balance check and record data.
03.03 Utilize proper personal safety procedures.

04.0 MAINTAIN AIRCRAFT FLUID LINES AND FITTINGS--The student will be able to:

04.01 Fabricate and install rigid and flexible fluid lines and fittings.
04.02 Identify and utilize special fluid line tools.

05.0 PERFORM AIRCRAFT MATERIALS AND PROCESSES SKILLS--The student will be able to:

05.01 Identify and select appropriate nondestructive testing methods.
05.02 Perform penetrant, chemical etching, and magnetic particle inspections.
05.03 Perform basic heat-treating processes.
05.04 Identify and select aircraft.
05.05 Inspect and check welds.
05.06 Perform precision measurements.
05.07 Perform safety wiring techniques.

06.0 PERFORM GROUND OPERATIONS AND SERVICING DUTIES--The student will be able to:

06.01 Start, ground operate, move, service, and secure aircraft.
06.02 Identify and select fuels.
06.03 Comply with prescribed shop and personal safety procedures.

07.0 PERFORM CLEANING AND CORROSION CONTROL OPERATIONS--The student will be able to:

07.01 Identify and select cleaning materials.
07.02 Perform aircraft cleaning and corrosion control.
07.03 Identify and utilize appropriate equipment for cleaning corrosion

control.
07.04 Observe appropriate personal safety procedures for corrosive chemicals.

08.0 DEMONSTRATE MATHEMATICAL SKILLS--The student will be able to:

08.01 Extract roots and raise numbers to a given power.
08.02 Determine areas and volumes of various geometrical shapes.
08.03 Solve ratio, proportion, and percentage problem.
08.04 Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.

09.0 MAINTAIN FORMS AND RECORDS--The student will be able to:

09.01 Write descriptions of aircraft condition and work performed.
09.02 Complete required maintenance forms, records, and inspection reports.

10.0 APPLY BASIC PHYSICS TO AIRFRAME SYSTEMS--The student will be able to:

10.01 Use the principles of simple machines; sound, fluid, and heat dynamics.

11.0 DEMONSTRATE THE USE OF MAINTENANCE PUBLICATIONS--The student will be able to:

11.01 Select and use FAA and manufacturer's aircraft maintenance specifications and related regulations.
11.02 Read technical data.

12.0 INTERPRET MECHANIC PRIVILEGES--The student will be able to:

12.01 Exercise mechanic privileges within the limitations prescribed by FAR Part 65.
12.02 Comply with prescribed shop and personal safety procedures.

13.0 PERFORM BASIC RECIPROCATING ENGINE SKILLS--The student will be able to:

13.01 Inspect and repair 14-cylinder or larger radial engine.
13.02 Overhaul reciprocating engine.
13.03 Inspect, check, service, and repair opposed and radical engines and reciprocating engine installations.
13.04 Install, troubleshoot, and remove reciprocating engines.

14.0 PERFORM BASIC TURBINE ENGINE SKILLS--The student will be able to:

14.01 Overhaul turbine engine.
14.02 Inspect, check, service, and repair turbine engines and turbine engine installations.
14.03 Install, troubleshoot, and remove turbine engines.

15.0 PERFORM ENGINE INSPECTION--The student will be able to:

15.01 Perform powerplant conformity and air worthiness inspections.
15.02 Perform appropriate safety wiring checks.

16.0 MAINTAIN ENGINE INSTRUMENT SYSTEMS--The student will be able to:

16.01 Troubleshoot, service, and repair fluid rate-of-flow indicating systems.
16.02 Inspect, check, service, troubleshoot, and repair engine temperature, pressure, and r.p.m. indicating systems.

17.0 MAINTAIN ENGINE FIRE PROTECTION SYSTEMS--The student will be able to:

17.01 Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
17.02 Perform appropriate safety wiring check and repairs.

18.0 MAINTAIN ENGINE ELECTRICAL SYSTEMS--The student will be able to:

18.01 Repair engine electrical system components.
18.02 Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.
18.03 Identify and utilize special electrical tools and equipment.

19.0 MAINTAIN LUBRICATION SYSTEMS--The student will be able to:

19.01 Identify and select lubricants.
19.02 Repair engine lubrication system components.
19.03 Inspect, check, service, troubleshoot, and repair engine lubrication system.

20.0 MAINTAIN IGNITION SYSTEMS--The student will be able to:

20.01 Overhaul magneto and ignition harness.
20.02 Repair engine ignition system components.
20.03 Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine ignition systems.

21.0 MAINTAIN FUEL METERING SYSTEMS--The student will be able to:

21.01 Inspect, check, and service water injection systems.
21.02 Overhaul carburetor.
21.03 Repair engine fuel metering system components.
21.04 Inspect, check, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.
21.05 Perform safety wiring techniques.

22.0 MAINTAIN ENGINE FUEL SYSTEMS--The student will be able to:

22.01 Repair engine fuel system components.
22.02 Inspect, check, service, troubleshoot, and repair engine fuel systems.
22.03 Perform appropriate safety wiring checks and repairs.

23.0 MAINTAIN INDUCTION SYSTEMS--The student will be able to:

23.01 Inspect, check, troubleshoot, service and repair engine ice and rain control systems.
23.02 Inspect, check, service, and repair heat exchangers and superchargers.
23.03 Inspect, check, service, and repair carburetor air intake and induction manifolds.

24.0 MAINTAIN ENGINE COOLING SYSTEMS--The student will be able to:

24.01 Repair engine cooling system components.
24.02 Inspect, check, troubleshoot, service and repair engine cooling systems.

25.0 MAINTAIN ENGINE EXHAUST SYSTEMS--The student will be able to:

25.01 Repair engine exhaust system components.
25.02 Inspect, check, troubleshoot, service and repair engine exhaust

systems.

26.0 MAINTAIN AIRCRAFT PROPELLERS--The student will be able to:

26.01 Inspect, check, service and repair propeller synchronizing and ice control systems.
26.02 Identify and select propeller lubricants.
26.03 Balance propellers.
26.04 Repair propeller control system components.
26.05 Inspect and repair fixed-pitch, constant speed and feathering propellers and governing systems.
26.06 Install, troubleshoot and remove propellers.

27.0 DEMONSTRATE KNOWLEDGE OF FAA LICENSING REQUIREMENTS--The student will be able to:

27.01 Complete the FAA Power Plant Examination.
27.02 Display an FAA Power Plant Mechanic's license.

28.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

28.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
28.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
28.03 Read and follow written and oral instructions.
28.04 Answer and ask questions coherently and concisely.
28.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
28.06 Demonstrate appropriate telephone/communication skills.

29.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

29.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
29.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
29.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
29.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
29.05 Demonstrate an understanding of federal, state and local taxes and their computation.

30.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

30.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
30.02 Draw conclusions or make inferences from data.
30.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
30.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

31.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct a job search.
31.02 Secure information about a job.

31.03 Identify documents which may be required when applying for a job interview.
31.04 Complete a job application form correctly.
31.05 Demonstrate competency in job interview techniques.
31.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
31.07 Identify and adopt acceptable work habits.
31.08 Demonstrate knowledge of how to make job changes appropriately.
31.09 Demonstrate acceptable employee health habits.
31.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

32.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

32.01 Define entrepreneurship.
32.02 Describe the importance of entrepreneurship to the American economy.
32.03 List the advantages and disadvantages of business ownership.
32.04 Identify the risks involved in ownership of a business.
32.05 Identify the necessary personal characteristics of a successful entrepreneur.
32.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Architectural Design and Construction Technology
CODE NUMBER: Secondary ______ Postsecondary ______
Florida CIP 0615.010100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational
x Postsecondary Vocational ____ Other ______________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as construction planners, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, assisting architects and architectural engineers in planning and designing structures, using construction materials, and dealing with contrasts and specifications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in model building, construction material utilization, testing materials and examining structures to determine their compliance with building codes and architectural design.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is

Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Communicate effectively.
02. Identify, select, apply, and maintain drafting and graphic materials and equipment.
03. Identify construction materials and their application.
04. Interpret drawings and documents.
05. Interpret and apply basic principles of architectural and engineering design.
06. Interpret and apply codes, regulations, and technical literature.
07. Produce architectural working drawings.
08. Produce structural drawings in steel and concrete.
09. Prepare subcontractor shop drawings.
10. Survey and assess construction sites.
11. Estimate basic quantities.
12. Perform office and administrative procedures.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Architectural Design and Construction Technology POSTSECONDARY NUMBER: __________

01.0 COMMUNICATE EFFECTIVELY--The student will be able to:

01.01 Identify communication channels in organizations.
01.02 Develop and use effective means of communications.
01.03 Develop an effective working relationship with others.
01.04 Prepare business correspondence, memos, and reports.
01.05 Compose clear and concise oral and written technical reports and presentations.
01.06 Participate in technical discussion and meetings.

02.0 IDENTIFY, SELECT, APPLY, AND MAINTAIN DRAFTING AND GRAPHIC MATERIALS AND EQUIPMENT--The student will be able to:

02.01 Apply functions of light table.
02.02 Use architectural and engineering scales.
02.03 Identify and select drawing materials.
02.04 Select, apply, and maintain basic drawing instruments.
02.05 Identify, apply, and maintain lettering instruments.
02.06 Identify and select leads, lead holders, sharpeners and erasers.
02.07 Identify and select reproduction materials.
02.08 Identify, operate, and maintain reproduction equipment.
02.09 Select and apply architectural and engineering curves and templates.
02.10 Set up and maintain drafting machine, T square, and parallel rule.
02.11 Identify, select, and apply commercial press on graphic materials.
02.12 Operate and maintain inking equipment and materials.
02.13 Identify, select, and apply color markers and pencils.
02.14 Identify, select, and apply water base colors.
02.15 Select and apply scribing materials and instruments.
02.16 Operate calculators.
02.17 Measure area using planimeter.
02.18 Identify and apply metric system.
02.19 Identify, operate, and maintain photography equipment.
02.20 Apply photographic techniques.
02.21 Apply and develop lettering and drawing techniques.

03.0 IDENTIFY CONSTRUCTION MATERIALS AND THEIR APPLICATION--The student will be able to:

03.01 Identify formwork materials and methods.
03.02 Identify concrete materials and applications.
03.03 Identify reinforcing steel and applications.
03.04 Identify structural steel shapes and applications.
03.05 Identify waterproofing materials and vapor barriers and applications.
03.06 Identify wood construction materials and applications.
03.07 Identify masonry materials and applications.
03.08 Identify exterior finishes and applications.
03.09 Identify insulation materials and applications.
03.10 Identify glass and glazing materials and applications.
03.11 Identify roofing materials and applications.
03.12 Identify flashings and applications.
03.13 Identify adhesives and sealants and applications.
03.14 Identify floor finish materials and applications.

03.15 Identify wall finish materials and applications.
03.16 Identify ceiling finish materials and applications.
03.17 Identify plastic materials and applications.
03.18 Identify miscellaneous metals and applications.
03.19 Identify millwork and applications.
03.20 Identify finish hardware and applications.
03.21 Identify manufactured specialties and applications.
03.22 Identify basic electrical components.
03.23 Identify basic H V A C components.
03.24 Identify basic plumbing components.
03.25 Identify paving materials and applications.
03.26 Identify fire proofing materials and applications.
03.27 Identify applications of pre-engineered and prefabricated structures.

04.0 INTERPRET DRAWINGS AND DOCUMENTS--The student will be able to:

04.01 Interpret technical symbols.
04.02 Interpret topographical drawings.
04.03 Interpret aerial photographs and maps.
04.04 Interpret site drawings.
04.05 Interpret architectural drawings.
04.06 Interpret specifications.
04.07 Interpret addendums.
04.08 Interpret notice of change and change orders.
04.09 Interpret shop drawings.
04.10 Interpret structural drawings.
04.11 Interpret mechanical drawings.
04.12 Interpret electrical drawings.
04.13 Interpret modular approach to buildings.
04.14 Identify and interpret contracts.
04.15 Identify and interpret liens.
04.16 Interpret deeds.
04.17 Interpret master and development plans and documents.

05.0 INTERPRET AND APPLY BASIC PRINCIPLES OF ARCHITECTURAL AND ENGINEERING DESIGN--The student will be able to:

05.01 Conduct and interpret concrete slump test.
05.02 Take test cylinder and interpret results.
05.03 Interpret soil analysis reports.
05.04 Interpret compaction test reports.
05.05 Interpret theory of loads.
05.06 Determine effect of loads on materials.
05.07 Interpret principles of expansion and contraction and control.
05.08 Interpret and apply fundamentals of site requirements.
05.09 Determine and apply space relationships.

06.0 INTERPRET AND APPLY CODES, REGULATIONS, AND TECHNICAL LITERATURE--The student will be able to:

06.01 Interpret and apply graphic and time saver standards.
06.02 Interpret and apply national building codes.
06.03 Interpret and apply C. M. H. C. residential standards.
06.04 Interpret and apply national fire code.
06.05 Interpret and apply provincial codes and regulations.
06.06 Interpret and apply municipal codes and regulations.
06.07 Interpret zoning bylaws and regulations.
06.08 Interpret zoning maps.
06.09 Interpret trade magazines and catalogs.
06.10 Interpret trade manuals.
06.11Interpret C. I. C. T. manual.

06.12 Interpret yardstick costing manual.
06.13 Interpret and apply C. E. T. regulations.
06.14 Interpret and apply construction association regulations.

07.0 PRODUCE ARCHITECTURAL WORKING DRAWINGS--The student will be able to:

07.01 Prepare floor plan drawings.
07.02 Prepare foundation plan and detail drawings.
07.03 Prepare elevation drawings.
07.04 Prepare landscape layouts.
07.05 Prepare schedules.
07.06 Prepare sections.
07.07 Build architectural models.
07.08 Prepare truss drawings.
07.09 Prepare stairway drawings.
07.10 Prepare fireplace drawings.
07.11 Prepare plot plan drawings.

08.0 PRODUCE STRUCTURAL DRAWINGS IN STEEL AND CONCRETE--The student will be able to:

08.01 Draw beam connections.
08.02 Draw structural assemblies.
08.03 Prepare erection plans.
08.04 Prepare structural drawings.
08.05 Make take-offs from reinforced concrete engineering drawings.
08.06 Prepare footing and foundation drawings.
08.07 Prepare column detail drawings.
08.08 Prepare floor and roof detail drawings.
08.09 Prepare special structure detail drawings.
08.10 Prepare framed beam connection drawings.
08.11 Prepare stiffened seat connection drawings.
08.12 Prepare bolted column detail drawings.
08.13 Prepare gusset plate drawings.

09.0 PREPARE SUBCONTRACTOR SHOP DRAWINGS--The student will be able to:

09.01 Prepare plumbing plan drawings.
09.02 Prepare climate control drawings.
09.03 Prepare electrical plan drawings.

10.0 SURVEY AND ASSESS CONSTRUCTION SITES--The student will be able to:

10.01 Select and apply measuring tapes and chains.
10.02 Prepare site sketches.
10.03 Apply methods of on site measuring.
10.04 Interpret survey books and logs.
10.05 Identify and apply basic principles of levels and rods.
10.06 Identify and apply basic principles of transits.
10.07 Interpret angular and distance measurements to bearings and azimuth.
10.08 Outline basics of site meetings and inspection.

11.0 ESTIMATE BASIC QUANTITIES--The student will be able to:

11.01 Compute area and volume of buildings.
11.02 Estimate quantities of excavation and fill.
11.03 Take off quantities of form work.
11.04 Take off quantities of concrete.
11.05 Take off quantities of lumber.
11.06 Take off quantities of masonry.
11.07 Interpret and complete standard estimators forms.

12.0 PERFORM OFFICE AND ADMINISTRATIVE PROCEDURES--The student will be able to:

12.01 Organize and maintain personal work area.
12.02 Operate office equipment.
12.03 Estimate, order, and maintain drafting supplies.
12.04 Maintain file drawing systems.
12.05 Maintain record of building costs.
12.06 Develop and maintain technical reference library.
12.07 Identify basic project management systems.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.

16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Architectural Drafting

CODE NUMBER: Secondary ______ Postsecondary I480102

Florida CIP 0648.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as drafters (22514230), architectural drafters (001.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, mathematical skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to support architects and architectural engineers in developing plans for buildings or other structures using a variety of materials.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in creating layouts and designs in keeping with building codes, zoning laws, ordinances, and other regulations and in styling and planning in keeping within cost limitations and client preferences.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is one of the many appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Completion of the 900 hour core Drafting program is a prerequisite for entry into this postsecondary specialization program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare pictorial drawings.
02. Prepare architectural drawings.
03. Prepare basic structural drawings.
04. Prepare basic civil drawings.
05. Prepare basic building utility drawings.
06. Prepare advanced computer aided drawings.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate math skills.
09. Demonstrate appropriate understanding of basic science.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Architectural Drafting POSTSECONDARY NUMBER: I480102

01.0 PREPARE PICTORIAL DRAWINGS--The student will be able to.

01.01 Prepare isometric drawings.
01.02 Prepare oblique drawings.
01.03 Prepare perspectives.

02.0 PREPARE ARCHITECTURAL DRAWINGS--The student will be able to.

02.01 Interpret catalogs, specifications, technical tables, codes and ordinances.
02.02 Prepare floor plan drawings, with dimensions.
02.03 Prepare foundation plan and detail drawings, with dimensions.
02.04 Prepare roof plans.
02.05 Prepare elevation drawings.
02.06 Prepare sections and details.
02.07 Prepare schedules and cost estimates.
02.08 Prepare a landscape layout.

03.0 PREPARE BASIC STRUCTURAL DRAWINGS--The student will be able to.

03.01 Interpret structural manuals and tables. technical tables.
03.02 Draw structural steel connections.
03.03 Draw reinforcing reinforced concrete details.
03.04 Draw structural wood details.

04.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

04.01 Prepare plat drawings.
04.02 Prepare street layout drawings.
04.03 Prepare topographic drawings.
04.04 Prepare drainage drawings.
04.05 Prepare map drawings.

05.0 PREPARE BASIC BUILDING UTILITY DRAWINGS--The student will be able to:

05.01 Prepare electrical plans and schedules.
05.02 Prepare HVAC plans and schedules.
06.03 Prepare plumbing plans, riser diagram, and schedules.

06.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

06.01 Produce architectural drawings.
06.02 Produce structural plans and detail drawings.
06.04 Produce civil drawings.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.

07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS -- The student will be able to.

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
10.11 Identify or demonstrate acceptable personal grooming habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.
11.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Architectural Drafting Skills

CODE NUMBER: Secondary 8725200 Postsecondary ______

Florida CIP 0648.010101

SECONDARY SCHOOL CREDITS 2 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ____7-9 x 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G TEC DRAFT @ 7 G
¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230).

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint machine operation, use of drafting tools and equipment, drafting skills, charts and graphs, computer aided drawings, and technical mathematics.

Listed below are the courses that comprise this program when offered at the secondary level:

8725210	Architectural Drafting Skills 1
8725220	Architectural Drafting Skills 2

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, drafting tools, CAD systems, drafting tracks, blueprint machine materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Completion of the Drafting Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization area concurrently may be necessary.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare architectural drawings.
02. Prepare advanced architectural drawings.
03. Demonstrate employability skills.
04. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8725200

PROGRAM TITLE: Architectural Drafting Skills POSTSECONDARY NUMBER:

01.0 PREPARE ARCHITECTURAL DRAWINGS--The student will be able to:

01.01 Draft foundation plan.
01.02 Dimension plans.
01.03 Calculate square footages.
01.04 Prepare electrical and plumbing drawings.
01.05 Prepare 2 point perspective drawing.
01.06 Produce drawings manually and electronically.

02.0 PREPARE ADVANCED ARCHITECTURAL DRAWINGS--The student will be able to:

02.01 Draft floor plan.
02.02 Apply building codes.
02.03 Draft roof plan.
02.04 Draft exterior elevations.
02.05 Draft typical wall section.
02.06 Produce drawings manually and electronically.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS -- The student will be able to.

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
03.11 Identify or demonstrate acceptable personal grooming habits.

04.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

04.01 Define entrepreneurship.
04.02 Describe the importance of entrepreneurship to the American economy.
04.03 List the advantages and disadvantages of business ownership.
04.04 Identify the risks involved in ownership of a business.
04.05 Identify the necessary personal characteristics of a successful entrepreneur.
04.06 Identify the business skills needed to operate a small business efficiently and effectively.
04.07 Identify basic occupational licensing and insurance.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Architectural Drafting Skills PROGRAM NUMBER: 8725200

COURSE TITLE: Architectural Drafting Skills 1 COURSE NUMBER: 8725210

COURSE DESCRIPTION:

01.0 PREPARE ARCHITECTURAL DRAWINGS--The student will be able to:

01.01 Draft foundation plan.
01.02 Dimension plans.
01.03 Calculate square footages.
01.04 Prepare electrical and plumbing drawings.
01.05 Prepare 2 point perspective drawing.
01.06 Produce drawings manually and electronically.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Architectural Drafting Skills PROGRAM NUMBER: 8725200

COURSE TITLE: Architectural Drafting Skills 2 COURSE NUMBER: 8725220

COURSE DESCRIPTION:

02.0 PREPARE ADVANCED ARCHITECTURAL DRAWINGS--The student will be able to:

02.01 Draft floor plan.
02.02 Apply building codes.
02.03 Draft roof plan.
02.04 Draft exterior elevations.
02.05 Draft typical wall section.
02.06 Produce drawings manually and electronically.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS -- The student will be able to.

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
03.11 Identify or demonstrate acceptable personal grooming habits.

04.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

04.01 Define entrepreneurship.
04.02 Describe the importance of entrepreneurship to the American economy.
04.03 List the advantages and disadvantages of business ownership.
04.04 Identify the risks involved in ownership of a business.
04.05 Identify the necessary personal characteristics of a successful entrepreneur.
04.06 Identify the business skills needed to operate a small business efficiently and effectively.
04.07 Identify basic occupational licensing and insurance.

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Body Repair and Refinishing

CODE NUMBER: Secondary _______ Postsecondary I470603

Florida CIP 0647.060300

SECONDARY
SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: AUTO IND @ 7 G AUTO BODY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive body, related repairers (85305631), automobile body repairers (807.381-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic trade skills; refinishing skills; sheetmetal repair skills; frame and unibody squaring and aligning; use of fillers; paint systems and undercoats; related welding skills; related mechanical skills; trim-hardware maintenance; glass servicing; and other miscellaneous repairs.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: use of hand and power tools; panel repairs; use of spray equipment; use of frame and alignment equipment; application of body fillers; paint systems; use of shop materials; glass replacement; and use of MIG, oxyacetylene and plastic welders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is:

Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other. This program contains considerable content similar to that in the secondary program, Basic Automotive Body Repair and Refinishing.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours when content from the Florida common core automotive collision repair program (Basic Automotive Body Repair and Refinishing) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate vehicle and industry knowledge, business management and shop and occupational safety skills.
02. Prepare vehicles for repair and refinishing.
03. Repair, replace and adjust outer body panels.
04. Prepare parts and panels for metal finishing.
05. Prepare and apply body fillers.
06. Perform welding operations.
07. Setup vehicle for measuring and pulling.
08. Prepare surfaces for refinishing.
09. Maintain and operate spray equipment.
10. Select and apply appropriate paints and finishes.
11. Finish defects, causes and cures.
12. Perform miscellaneous repairs.
13. Repair fiberglass and plastic components.
14. Inspect, measure, and repair unibody vehicles.
15. Inspect and repair frame type vehicle bodies.
16. Demonstrate appropriate communication skills.
17. Demonstrate appropriate math skills.
18. Demonstrate appropriate understanding of basic math.
19. Demonstrate employability skills.
20. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　SECONDARY NUMBER: __________

PROGRAM TITLE: Automotive Body Repair and Refinishing　　POSTSECONDARY NUMBER: I470603

01.0 DEMONSTRATE VEHICLE AND INDUSTRY KNOWLEDGE, BUSINESS MANAGEMENT AND SHOP AND OCCUPATIONAL SAFETY SKILLS -- The student will be able to:

01.01 Comply with safety rules established by OSHA, NIOSH, EPA, and DER regarding chemicals and hazardous materials.
01.02 Comply with safety rules established by OSHA and NIOSH regarding personal clothing and devices.
01.03 Comply with safety rules regarding hand tools and power equipment and use them properly, including fire extinguishers.
01.04 Comply with locally developed shop safety rules and regulations.
01.05 Identify sources of airborne contamination and other hazards.
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation.
01.07 Select proper spray mask; inspect the spray mask to insure proper fit and operation; inspect the condition of the mask filters and other components.
01.08 Explain the "Right to Know Law" as applicable to auto body repair occupations.
01.09 Identify vehicle parts by name, location and function.
01.10 Read and explain damage reports.
01.11 Operate basic office machines.
01.12 Demonstrate basic keyboarding skills and computer usage.
01.13 Perform structural damage analysis and determine repair procedures.
01.14 Determine acceptable parts to use: new, used or aftermarket.
01.15 Prepare damage reports manually to industry standards.
01.16 Prepare damage reports to industry standards using a computer.

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Use specification and crash manuals including "P" pages.
02.02 Diagnose and analyze damage to determine appropriate methods for overall repair.
02.03 Remove, replace and align damaged outside trim and moldings.
02.04 Remove, replace and align damaged or necessary inside trim and moldings.
02.05 Remove, replace and align damaged, non-structural body panels and components that may interfere with or be damaged during repair.
02.06 Protect panels and parts adjacent to repair area to prevent damage.
02.07 Remove dirt, grease and wax from those areas to be repaired.
02.08 Remove dirt, corrosion, under coatings, sealers, and/or other protective coatings necessary to perform repairs to structural areas.
02.09 Remove, replace, and align repairable plastics and other parts that are recommended for off-car repair.
02.10 Locate, read, and interpret automobile manufacturers' data plates.
02.11 Locate, remove and replace to specifications, those vehicle electrical/electronic devices that might be damaged during repair.
02.12 Explain proper air bag operation and passive restraint handling.

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able

to:

03.01 Remove, replace, and adjust a bolted panel or panel assembly.
03.02 Remove, replace, and align a welded (non-structural) steel panel or panel assembly.
03.03 Determine the extent of damage to structural body panels; repair, weld, or replace in accordance with manufacturers' specifications.
03.04 Remove, replace, and align hoods, hood hinges and hood latches.
03.05 Remove, replace, and align deck lids, lid hinges and lid latches.
03.06 Remove, replace, and align doors, tailgates, hatches, lift gates and hinges.
03.07 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil filled energy-absorbing-type bumper isolators that are being discarded).
3.08 Check door hinge condition; replace hinge pins and bushings as needed, check door frames, check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders and tops.
03.09 Check and adjust latch assemblies on all hinged components.
03.10 Straighten roughed out contours of damaged panels to a surface condition for body filling or metal finishing.
03.11 Weld cracked or torn steel body panels,; reweld broken welds.
03.12 Apply protective coatings and sealants to structural panels.
03.13 Heat shrink stretched panel areas back to contour.
03.14 Cold shrink stretched panel areas back to contour.
03.15 Repair or replace door skins and intrusion beams.

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles.
04.02 Identify heat effects on metals.
04.03 Identify the importance of maintaining the structural integrity of an vehicle body.
04.04 Remove the paint from the damaged area of a body panel.
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities.
04.06 Disc sand the repaired body panel to produce final smoothness.

05.0 PREPARE AND APPLY BODY FILLERS--The student will be able to:

05.01 Mix plastic filler.
05.02 Apply plastic body filler and cheese grate during curing.
05.03 Block sand cured plastic body fillers to contour and then finish sand.
05.04 Describe the process of cleaning and tinning surfaces of body panels for solder filling and neutralizing.

06.0 PERFORM WELDING OPERATIONS--The student will be able to:

06.01 Demonstrate welding safety procedures.
06.02 Identify metal types prior to welding.
06.03 Setup, operate and maintain metal inert gas (MIG) welding equipment.
06.04 Perform various welds with MIG equipment including plug, butt, and lap.
06.05 Setup and maintain oxyacetylene welding equipment.
06.06 Explain various welding, cutting, and heating techniques with oxyacetylene equipment.
06.07 Describe plasma cutting.
06.08 Remove, replace, and align damaged, structural body panels and components that may interfere with or be damaged during repairing.

06.09 Weld aluminum.
06.10 Explain electric compression spot welding.
06.11 Setup, operate, and maintain Tungsten Inert Gas (TIG) welding equipment.
06.12 Set up and perform plasma cutting operations.

07.0 SETUP VEHICLE FOR MEASURING AND PULLING--The student will be able to:

07.01 Determine and plan methods and order of repair.
07.02 Mount vehicle on anchoring equipment.
07.03 Measure vehicle damage using manufacturers' specifications.
07.04 Attach pulling equipment, pull and re-measure.

08.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

08.01 Inspect and identify types of finishes and surface conditions and develop a plan for refinishing using one paint system from start to finish in conformance with paint system manufacturer specifications.
08.02 Gain access to, remove and store trim and molding.
08.03 Remove dirt, wax, and road grime from areas to be refinished and adjacent surfaces including complete washing of the vehicle.
08.04 Inspect and identify type of substrate, and surface condition; develop a plan for refinishing.
08.05 Chemically and mechanically remove paint finishes.
08.06 Dry and wet sand areas to be refinished.
08.07 Featheredge broken areas to be refinished.
08.08 Mask and protect other areas that will not be refinished.
08.09 Mix primer, primer surfacer or primer sealer and spray onto the surface of repaired areas including two components and self etching primers.
08.10 Apply glazing putty to minor surface imperfections.
08.11 Select proper abrasives and dry or wet sand area to which primer-surfacer and glazing putty have been applied.
08.12 Compound around the edges of repaired areas to be refinished.
08.13 Remove dust from areas to be refinished including cracks or moldings of adjacent areas.
08.14 Clean area to be refinished with a proper solution.
08.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished.
08.16 Determine when sealing is needed or desirable and apply suitable sealer to the area being refinished.
08.17 Scuff sand to remove nibs or overspray from a sealer.
08.18 Apply adhesion promoter over areas to be painted and blend into adjacent areas.
08.19 Apply stone chip resistant coating.
08.20 Restore corrosion resistant coatings, caulking and seam sealers to repaired areas.

09.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

09.01 Explain, adjust and use a variety of spray guns including siphon feed, pressure feed, gravity feed and HVLP.
09.02 Check and adjust air pressure at the spray gun.
09.03 Adjust spray gun fluid and pattern control valves.
09.04 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
09.05 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, air sources, and spray environment).
09.06 Maintain and properly use the spray booth.

10.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

10.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components.
10.02 Determine the type and color of paint already on a vehicle and identify alternates.
10.03 Measure, shake, stir, thin or reduce, and strain paint.
10.04 Verify color match before applying and adjust if needed.
10.05 Apply acrylic enamel for spot, panel and overall refinishing.
10.06 Sand, buff, and polish finishes.
10.07 Clean and detail a vehicle after completion of refinishing.
10.08 Apply urethane enamel for spot, panel and overall refinishing.
10.09 Apply urethane clear coat for spot, panel and overall repairs.
10.10 Apply decals, transfers, tapes, wood-grains, pinstripes (painted and taped), etc.
10.11 Properly dispose of hazardous waste.
10.12 Identify the types of plastic parts to be finished and determine the proper refinishing procedure.
10.13 Apply a finish coat to plastic parts.
10.14 Clean, condition and refinish vinyl (e.g upholstery, dashes and tops).
10.15 Apply a tri-coat paint system.
10.16 Identify and explain the characteristics of water-borne paint systems.

11.0 FINISH DEFECTS, CAUSES, AND CURES -- The student will be able to:

11.01 Check for rust spots; determine the cause(s) and correct the condition.
11.02 Identify paint cracking (crowsfeet or line-checking, micro-checking, etc); correct the condition.
11.03 Identify poor adhesion; determine the cause(s) and correct the condition.
11.04 Identify blistering appearance in the paint surface; determine the cause(s), and correct the condition.
11.05 Identify water spotting on paint surface, correct the condition.
11.06 Identify finish damage caused by bird droppings, tree sap, and other natural causes, correct the condition.
11.07 Identify finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes); correct the condition.
11.08 Identify die-back conditions (dulling of the paint film showing haziness and/or film distortion showing shrinking); correct the condition.
11.09 Identify chalking (oxidation); correct the condition.
11.10 Identify body filler bleed-through; correct the condition.
11.11 Identify pin-holing; correct the condition.

12.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

12.01 Align headlamps.
12.02 Apply rust repair methods including grinding, sandblasting, and metal preparation.
12.03 Remove and replace headliners, carpets, seats and other interior components and trim.
12.04 Inspect, repair or replace weather stripping.
12.05 Identify procedures to perform two- and four- wheel alignments.
12.06 Diagnose and repair water leaks, dust leaks and wind noises.
12.07 Inspect, remove and replace all stationary glass (including windshield, back lights, etc.) using manufacturers' recommended installation materials and procedures including electrically

heated glass.

12.08 Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanism and related controls.
12.09 Repair/replace all power driven accessories and related controls.
12.10 Inspect, repair or replace and adjust removable manually operated or electrically operated roof panels, hinges, latches, guides, handles, retainers and controls of sun roof.
12.11 Inspect, repair and replace convertible tops and related mechanisms.
12.12 Remove and replace vinyl tops.
12.13 Diagnose and repair damaged circuits, wires and electrical components.
12.14 Remove, replace and cap off air conditioner components.
12.15 Evacuate, recycle and recharge air conditioning systems.
12.16 Identify procedures to remove and replace engines and mounts.
12.17 Identify procedures to remove and replace transmissions and mounts.
12.18 Identify procedures to remove and replace suspension parts.
12.19 Identify procedures to remove and replace brake parts.
12.20 Identify procedures to bleed brakes.
12.21 Identify procedures to remove and replace fuel system components.
12.22 Demonstrate an understanding of ABS braking systems.
12.23 Inspect, adjust or repair steering, suspension and power-train components that affect four-wheel alignment.

13.0 REPAIR FIBER GLASS AND PLASTIC COMPONENTS -- The student will be able to:

13.01 Differentiate between fiberglass and sheet molded compound (SMC) to be repaired and the appropriate repair procedures (including plastic welding, chemical bonding and the use of structural adhesives).
13.02 Repair deep gouges and cracks in fiberglass panels and sheet molded compound (SMC).
13.03 Repair holes in fiberglass panels and SMC.
13.04 Repair fiberglass body panels and straighten/align panel supports.
13.05 Remove damaged areas from fiberglass panels and SMC and repair with partial panel installation.
13.06 Prepare the surfaces of and repair damage to, thermoplastic parts.
13.07 Prepare the surfaces of and repair damage to thermosetting-plastic parts.

14.0 INSPECT, MEASURE, AND REPAIR UNIBODY VEHICLES -- The student will be able to:

14.01 Precisely measure unibody vehicles.
14.02 Diagnose and measure unibody damage using self centering and tram gauges.
14.03 Diagnose and measure unibody damage using a datum plane.
14.04 Determine the location of all suspension, steering and power-train component attaching point to the body.
14.05 Clean, prime and apply protective coat to repaired unibody structural areas.
14.06 Determine the extent of the direct and indirect damage and the direction of impact and plan the method and order of repair.
14.07 Precisely measure unibody vehicles, check and adjust suspension mount points that effect four-wheel alignment.
14.08 Diagnose and measure unibody damage using a dedicated (fixture) measuring system.
14.09 Diagnose and measure unibody damage using a universal measuring system or a laser.
14.10 Attach proper body anchoring devices.

14.11 Straighten and align cowl assemblies.
14.12 Straighten and align roof pillars and roof panels.
14.13 Straighten and align door posts, sills, floor pans and rocker panels.
14.14 Straighten and align quarter panels, wheel housing assemblies and rear body sections (including rail, suspension and power train panels).
14.15 Straighten/align front end sections (aprons, strut towers, upper/lower rails, steering, suspension and power train mounting points).
14.16 Recognize the limitations of applying heat to high strength steel structural components, use proper heat stress relief methods on high strength steel and weld in accordance with manufacturers' specifications.
14.17 Use proper cold stress relief methods.
14.18 Remove folds, curves, creases and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions.
14.19 Determine the extent of damage to structural steel body panels and repair, weld or replace them in accordance with manufacturers' specifications.
14.20 Determine the extent of damage to structural aluminum body panels in accordance with manufacturers' specifications.
14.21 Cut out damaged sections of structural steel body panels and weld in new and/or used replacement in accordance with accepted industry standards.
14.22 Recheck panel contour and alignment after pulling and correct or adjust as necessary.

15.0 INSPECT AND REPAIR FRAME TYPE VEHICLE BODIES -- The student will be able to:

15.01 Diagnose and measure frame damage using self centering and tram gauge.
15.02 Determine the extent of direct and indirect damage and the direction of impact and plan methods and order of repairs.
15.03 Clean, prime and protective coat repaired frame areas.
15.04 Straighten and align mash damage.
15.05 Straighten and align sag damage.
15.06 Straighten and align side sway damage.
15.07 Straighten and align twist damage.
15.08 Straighten and align kickup damage.
15.09 Straighten and align broadside damage.
15.10 Straighten and align diamond frame damage.
15.11 Remove and replace damaged frame horns, side rails, cross members and front or rear frame sections and weld cracks in frame members.
15.12 Repair, reinforce or replace weakened frame members in accordance with vehicle manufacturers; recommendations.

16.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

16.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
16.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
16.03 Read and follow written and oral instructions.
16.04 Answer and ask questions coherently and concisely.
16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
16.06 Demonstrate appropriate telephone/communication skills.

17.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

17.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
17.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
17.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
17.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
17.05 Demonstrate an understanding of federal, state and local taxes and their computation.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
18.02 Draw conclusions or make inferences from data.
18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

19.01 Conduct a job search.
19.02 Secure information about a job.
19.03 Identify documents which may be required when applying for a job interview.
19.04 Complete a job application form correctly.
19.05 Demonstrate competence in job interview techniques.
19.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
19.07 Identify acceptable work habits.
19.08 Demonstrate knowledge of how to make appropriate job changes.
19.09 Demonstrate acceptable employee health habits.
19.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

20.01 Identify characteristics of the American enterprise system.
20.02 Define inflation and deflation.
20.03 Illustrate the basic economic questions facing any society.
20.04 Determine the results of a change in demand or a change in supply.
20.05 List factors which contribute to economic growth.
20.06 Identify characteristics of different types of business ownership.
20.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Detailing and Reconditioning

CODE NUMBER: Secondary 8710000 Postsecondary I470623

Florida CIP 0647.060302

SECONDARY POSTSECONDARY ADULT
SCHOOL CREDITS 3 COLLEGE CREDITS___ VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 x 9-12 x Postsecondary Adult Vocational

__ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AUTO BODY @ 7 G AUTO IND @ 7 G AUTO MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive body, related repairers (85305631),automotive detailers, new car preparation persons, used car preparation persons, or to provide supplemental training for persons currently or previously employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8710010	Automotive Detailing 1
8710020	Automotive Detailing 2
8710030	Automotive Detailing 3

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use of hand and power tools, interior and exterior cleaning of vehicles, fabric and vinyl repairs, cleaning and preservation of vehicle paint surfaces, and application of pinstripes and window tint.

III. SPECIAL NOTE:The Vocational Industrial Clubs of America, Inc. is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the

IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0 and Reading 8.0. This grade level number corresponds to a grade level equivalent score obtained on a state designated basic skills examinations.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate shop and occupational safety skills.
02. Demonstrate proficiency in washing a vehicle.
03. Perform vehicle interior cleaning.
04. Demonstrate proficiency in reconditioning vehicle paint surfaces.
05. Demonstrate proficiency in caring for vinyl tops.
06. Degrease and clean engine compartment.
07. Perform minor upholstery and vinyl repairs.
08. Demonstrate proficiency in applying vinyl pinstripes.
09. Demonstrate proficiency in applying window tint.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8710000

PROGRAM TITLE: Automotive Detailing and Reconditioning POSTSECONDARY NUMBER: I470623

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Comply with safety rules regarding chemicals.
01.03 Comply with shop safety rules regarding hand tools and power equipment.
01.04 Apply fire safety rules and procedures.
01.05 Comply with EPA standards regarding use of and disposal of chemicals.

02.0 DEMONSTRATE PROFICIENCY IN WASHING A VEHICLE--The student will be able to:

02.01 Identify the proper supplies needed to wash a vehicle.
02.02 Identify the correct sequence of washing a vehicle.
02.03 Dry the vehicle.
02.04 Inspect the finished vehicle.

03.0 PERFORM VEHICLE INTERIOR CLEANING--The student will be able to:

03.01 Identify the proper supplies and chemicals needed to clean and protect a vehicle interior.
03.02 Vacuum a vehicle interior.
03.03 Shampoo and/or clean vehicle upholstery.
03.04 Apply fabric guard chemicals.
03.05 Apply vinyl dressing and preservative chemicals.
03.06 Apply fabric reconditioning dyes.
03.07 Apply vinyl dyes.

04.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING VEHICLE PAINT SURFACES--The student will be able to:

04.01 Identify the proper supplies and chemicals needed to recondition vehicle paint surfaces.
04.02 Operate a power buffer.
04.03 Apply rubbing/buffing compound.
04.04 Remove heavy paint oxidation.
04.05 Apply polishing compounds.
04.06 Apply waxes, sealants, and polymers.
04.07 Apply touch-up paint.

05.0 DEMONSTRATE PROFICIENCY IN CARING FOR VINYL TOPS--The student will be able to:

05.01 Identify the proper supplies and chemicals needed to care for vehicle vinyl tops.
05.02 Apply vinyl top cleaners.
05.03 Apply vinyl top dyes.
05.04 Apply vinyl top dressings.

06.0 DEGREASE AND CLEAN VEHICLE ENGINE COMPARTMENT--The student will be able to:

06.01 Identify the proper supplies and chemicals needed to clean and recondition vehicle engine compartment.
06.02 Operate a high pressure washer.
06.03 Degrease engine and engine compartment.
06.04 Select and apply correct color engine paint.
06.05 Apply clear engine paint.
06.06 Inspect belts and hoses.

07.0 PERFORM MINOR UPHOLSTERY AND VINYL REPAIRS--The student will be able to:

07.01 Identify the supplies necessary to perform minor upholstery repair.
07.02 Repair fabric upholstery.
07.03 Repair vinyl seat upholstery.
07.04 Repair vinyl dashboards.

08.0 DEMONSTRATE PROFICIENCY IN APPLYING VINYL PINSTRIPES--The student will be able to:

08.01 Identify the supplies and materials necessary to pinstripe a vehicle.
08.02 Sketch a vehicle pinstripe layout.
08.03 Apply pinstripes to a vehicle.
08.04 Sketch a multi-color graphic design using vinyl material.
08.05 Apply a vinyl multi-color graphic design to a vehicle.

09.0 DEMONSTRATE PROFICIENCY IN APPLYING WINDOW TINT--The student will be able to:

09.01 Identify the supplies and materials necessary to apply window tint to a vehicle.
09.02 Comply with local and state regulations regarding application of window tint on motor vehicles.
09.03 Apply window tint on flat glass surfaces.
09.04 Apply window tint to curved glass surfaces.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and

their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Identify career opportunities in Auto Detailing.
13.02 Conduct a job search.
13.03 Secure information about a job.
13.04 Identify documents that may be required when applying for a job.
13.05 Complete a job application form correctly.
13.06 Demonstrate competence in job interview techniques.
13.07 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.08 Identify acceptable work habits.
13.09 Demonstrate knowledge of how to make appropriate job changes.
13.10 Demonstrate acceptable employee health habits.
13.11 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Automotive Detailing and Reconditioning
PROGRAM NUMBER: 8710000

COURSE TITLE: Automotive Detailing 1
COURSE NUMBER: 8710010

COURSE DESCRIPTION:

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Comply with safety rules regarding chemicals.
01.03 Comply with shop safety rules regarding hand tools and power equipment.
01.04 Apply fire safety rules and procedures.
01.05 Comply with EPA standards regarding use of and disposal of chemicals.

02.0 DEMONSTRATE PROFICIENCY IN WASHING A VEHICLE--The student will be able to:

02.01 Identify the proper supplies needed to wash a vehicle.
02.02 Identify the correct sequence of washing a vehicle.
02.03 Dry the vehicle.
02.04 Inspect the finished vehicle.

03.0 PERFORM VEHICLE INTERIOR CLEANING--The student will be able to:

03.01 Identify the proper supplies and chemicals needed to clean and protect a vehicle interior.
03.02 Vacuum a vehicle interior.
03.03 Shampoo and/or clean vehicle upholstery.
03.04 Apply fabric guard chemicals.
03.05 Apply vinyl dressing and preservative chemicals.
03.06 Apply fabric reconditioning dyes.
03.07 Apply vinyl dyes.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Automotive Detailing and Reconditioning
PROGRAM NUMBER: 8710000

COURSE TITLE: Automotive Detailing 2
COURSE NUMBER: 8710020

COURSE DESCRIPTION:

04.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING VEHICLE PAINT SURFACES--The student will be able to:

04.01 Identify the proper supplies and chemicals needed to recondition vehicle paint surfaces.

04.02 Operate a power buffer.
04.03 Apply rubbing/buffing compound.
04.04 Remove heavy paint oxidation.
04.05 Apply polishing compounds.
04.06 Apply waxes, sealants, and polymers.
04.07 Apply touch-up paint.

05.0 DEMONSTRATE PROFICIENCY IN CARING FOR VINYL TOPS--The student will be able to:

05.01 Identify the proper supplies and chemicals needed to care for vehicle vinyl tops.
05.02 Apply vinyl top cleaners.
05.03 Apply vinyl top dyes.
05.04 Apply vinyl top dressings.

06.0 DEGREASE AND CLEAN VEHICLE ENGINE COMPARTMENT--The student will be able to:

06.01 Identify the proper supplies and chemicals needed to clean and recondition vehicle engine compartment.
06.02 Operate a high pressure washer.
06.03 Degrease engine and engine compartment.
06.04 Select and apply correct color engine paint.
06.05 Apply clear engine paint.
06.06 Inspect belts and hoses.

07.0 PERFORM MINOR UPHOLSTERY AND VINYL REPAIRS--The student will be able to:

07.01 Identify the supplies necessary to perform minor upholstery repair.
07.02 Repair fabric upholstery.
07.03 Repair vinyl seat upholstery.
07.04 Repair vinyl dashboards.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Automotive Detailing and Reconditioning	PROGRAM NUMBER:	8710000
COURSE TITLE:	Automotive Detailing 3	COURSE NUMBER:	8710030

COURSE DESCRIPTION:

08.0 DEMONSTRATE PROFICIENCY IN APPLYING VINYL PINSTRIPES--The student will be able to:

08.01 Identify the supplies and materials necessary to pinstripe a vehicle.
08.02 Sketch a vehicle pinstripe layout.
08.03 Apply pinstripes to a vehicle.
08.04 Sketch a multi-color graphic design using vinyl material.
08.05 Apply a vinyl multi-color graphic design to a vehicle.

09.0 DEMONSTRATE PROFICIENCY IN APPLYING WINDOW TINT--The student will be able to:

09.01 Identify the supplies and materials necessary to apply window tint to a vehicle.
09.02 Comply with local and state regulations regarding application of window tint on motor vehicles.
09.03 Apply window tint on flat glass surfaces.
09.04 Apply window tint to curved glass surfaces.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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13.02 Conduct a job search.
13.03 Secure information about a job.
13.04 Identify documents that may be required when applying for a job.
13.05 Complete a job application form correctly.
13.06 Demonstrate competence in job interview techniques.
13.07 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.08 Identify acceptable work habits.
13.09 Demonstrate knowledge of how to make appropriate job changes.
13.10 Demonstrate acceptable employee health habits.
13.11 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Machine Shop

CODE NUMBER: Secondary _______ Postsecondary I480513

Florida CIP 0648.050301

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AUTO MACH @ 7 G
METAL WORK @ 7 G AUTO IND @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinists (89108676), automotive machinists (600.280-034), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, remanufacture of automotive engines to original factory specifications, make judgements on when to remachine or replace components, remachine components for engine rebuild, recognize metal fatigue, and manufacture unusual or special parts when necessary.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in cleaning, inspecting, grinding, drilling, honing, and reassembling automotive parts with an emphasis on accuracy.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Explain the principles of power.
02. Identify and use precision and non-precision hand tools.
03. Explain proper cleaning methods.
04. Disassemble and inspect engines.
05. Clean automotive engine components.
06. Surface grind heads.
07. Machine finish complete head.
08. Machine connecting rods and main bearing caps for finish honing.
09. Remachine cylinder walls.
10. Service pistons.
11. Service brake drums, disc brake system, and shoes.
12. Perform magnaflux nondestructive testing.
13. Service crankshaft.
14. Service flywheels and clutches.
15. Operate engine lathe.
16. Operate milling machine.
17. Operate drill press.
18. Demonstrate appropriate communication skills.
19. Demonstrate appropriate math skills.
20. Demonstrate appropriate understanding of basic science.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER:

PROGRAM TITLE: Automotive Machine Shop POSTSECONDARY NUMBER: I480513

01.0 EXPLAIN THE PRINCIPLES OF POWER--The student will be able to:

01.01 Demonstrate understanding of internal combustion engines.
01.02 Demonstrate understanding of concepts of heat, pressure, and compression as they relate to the internal combustion engine.
01.03 Explain differences between two and four cycle engines.
01.04 Demonstrate understanding of shop safety procedures.

02.0 IDENTIFY AND USE PRECISION AND NON-PRECISION HAND TOOLS--The student will be able to:

02.01 Select and use personal safety equipment.
02.02 Select, use, and maintain taps, dies, hones, drills, and reamers.
02.03 Select, use, and maintain punches, saws, chisels, and files.
02.04 Select and use micrometers, calipers, dial indicators, depth gauges, boring gauges, and plastigage.

03.0 EXPLAIN PROPER CLEANING METHODS--The student will be able to:

03.01 Identify types of soils.
03.02 Demonstrate understanding of chemicals and processes used for cleaning, including emulsion, parts washers, and cola and hot tanks.
03.03 Explain glass bead cleaning.

04.0 DISASSEMBLE AND INSPECT ENGINES--The student will be able to:

04.01 Remove and disassemble cylinder heads.
04.02 Remove and disassemble crankshafts, camshafts, rods, and pistons.
04.03 Inspect all parts and compare to acceptable tolerances.

05.0 CLEAN AUTOMOTIVE ENGINE COMPONENTS--The student will be able to:

05.01 Perform hot tank block cleaning.
05.02 Perform hot tank head cleaning.
05.03 Perform hot tank crankshaft cleaning.
05.04 Perform hot tank camshaft cleaning.
05.05 Bead clean valves and head.
05.06 Explain and demonstrate appropriate safety behavior while performing hot tank cleaning.

06.0 SURFACE GRIND HEADS--The student will be able to:

06.01 Set up and operate grinder.
06.02 Dress grinder wheel.
06.03 Inspect and replace grinder wheel.
06.04 Inspect finished heads.

07.0 MACHINE FINISH COMPLETE HEAD--The student will be able to:

07.01 Set up I. D. L. Machining Center to replace valve guides and seats.
07.02 Machine guides to proper size.
07.03 Machine valve seats.
07.04 Replace valve seats.

08.0 MACHINE CONNECTING RODS AND MAIN BEARING CAPS FOR FINISH HONING--The student will be able to:

08.01 Mark all rods and caps.
08.02 Check for bends and cracks.
08.03 Straighten rods.
08.04 Grind caps with rod and cap grinder.
08.05 Hone all rods.
08.06 Hone main bearing surfaces.

09.0 REMACHINE CYLINDER WALLS--The student will be able to:

09.01 Inspect cylinder blocks for damage.
09.02 Repair damaged areas.
09.03 Measure all cylinder bores.
09.04 Machine cylinder bores.
09.05 Hone cylinder walls.
09.06 Resleeve cylinder walls.

10.0 SERVICE PISTONS--The student will be able to:

10.01 Clean and inspect pistons.
10.02 Resize ring grooves.
10.03 Expand pistons (peening and knurling).
10.04 Fit piston pins.

11.0 SERVICE BRAKE DRUMS, DISC BRAKE SYSTEM AND SHOES--The student will be able to:

11.01 Clean, inspect, and measure components to be machined.
11.02 Set up and operate brake machining center.

12.0 PERFORM MAGNAFLUX NON-DESTRUCTIVE TESTING--The student will be able to:

12.01 Demonstrate understanding of magnaflux testing theory.
12.02 Perform testing by magnetizing with contacts.
12.03 Perform testing by magnetizing with coil.
12.04 Perform testing by magnetizing with a yoke.
12.05 Perform dye penetrate test.
12.06 Maintain testing equipment.

13.0 SERVICE CRANKSHAFTS--The student will be able to:

13.01 Check shaft in place.
13.02 Check shaft out of engine.
13.03 Straighten crankshaft.
13.04 Grind crankshaft.

14.0 SERVICE FLYWHEELS AND CLUTCHES--The student will be able to:

14.01 Inspect flywheels and clutch plates for wear and fatigue.
14.02 Measure and grind flywheels and clutch plates.

15.0 OPERATE ENGINE LATHE--The student will be able to:

15.01 Perform turning operations.
15.02 Perform facing operations.
15.03 Perform boring operations.
15.04 Perform drilling operations.

16.0 OPERATE MILLING MACHINE--The student will be able to:

16.01 Perform face milling operations
16.02 Perform climb operations.
16.03 Perform conventional operations.
16.04 Perform end operations.

17.0 OPERATE DRILL PRESS--The student will be able to:

17.01 Sharpen drills.
17.02 Perform drilling operations in press.

18.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

18.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
18.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
18.03 Read and follow written and oral instructions.
18.04 Answer and ask questions coherently and concisely.
18.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
18.06 Demonstrate appropriate telephone/communication skills.

19.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

19.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
19.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
19.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
19.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
19.05 Demonstrate an understanding of federal, state and local taxes and their computation.

20.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

20.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
20.02 Draw conclusions or make inferences from data.
20.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
20.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make appropriate job changes.
21.09 Demonstrate acceptable employee health habits.

21.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　　　　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　　　　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Mechanics

CODE NUMBER: Secondary 8709100　　　　Postsecondary ______

Florida CIP 0647.062400

SECONDARY　　　　　　POSTSECONDARY ADULT
SCHOOL CREDITS 5　　COLLEGE CREDITS___　　VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9　_x_9-12　___Postsecondary Adult Vocational

___Postsecondary Vocational　_x_Other 30,31

CERTIFICATION COVERAGE: AUTO MECH @ 7 G　AUTO IND @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive mechanics (85302632), automobile mechanic assistants (620.684-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; radiators, transmissions and carburetors; minor engine tune up; servicing automotive components; troubleshooting skills; the repair and overhaul of front ends; brakes and air conditioning systems; and basic shop management and safety skills.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level.

8709110	Automotive Mechanics 1
8709120	Automotive Mechanics 2
8709130	Automotive Mechanics 3
8709140	Automotive Mechanics 4
8709150	Automotive Mechanics 5

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: automatic and manual transmissions; drive trains; and steering, suspension, brake and electrical systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program.

When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

Student performance standards required for National Institute for Automotive Service Excellence (ASE) certification are identified with the initials ASE following the standard.

This program, when combined with Advanced Automotive Mechanics serves as the Florida common core automotive service program. Content is compatible with and a prerequisite for advanced skills contained in the PSAV programs, Automotive Technology and Autotronics, and the PSV program, Automotive Service Management Technology.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of automotive mechanics.
02. Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components.
03. Demonstrate proficiency in servicing steering, suspension and wheel systems.
04. Demonstrate proficiency in servicing automotive brake systems.
05. Demonstrate proficiency in servicing cooling, air conditioning and heating services.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　SECONDARY NUMBER: 8709100

PROGRAM TITLE: Automotive Mechanics　　POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vices and "C" Clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
01.05 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
01.06 Apply basic math skills.
01.07 Use and apply metric and English measurement skills.
01.08 Demonstrate an understanding of lubrication requirements.
01.09 Inspect, remove, replace and adjust all belts.
01.10 Perform auto safety inspection.
01.11 Demonstrate use of technical manuals, specification handbooks and charts.
01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster, camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
01.13 Demonstrate an understanding of the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm and control arm.
01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, power steering control valve and power steering fluid leaks.
01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
01.16 Demonstrate an understanding of disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
01.18 Demonstrate an understanding of basic heating and cooling systems.
01.19 Demonstrate an understanding of basic air conditioning systems.
01.20 Demonstrate knowledge of engine components.
01.21 Demonstrate an understanding of basic ignition and fuel systems.
01.22 Demonstrate an understanding of rear axle operation such as differential action; limited slip mechanisms; floating, nonfloating and semifloating.
01.23 Demonstrate an understanding of drive shaft operation, drive shaft construction and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint, spline output and spline drive shaft.
01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
01.25 Demonstrate an understanding of clutch operation.
01.26 Demonstrate an understanding of clutch release mechanisms to

include linkage and hydraulic.
01.27 Demonstrate an understanding of manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action and shift mechanisms.
01.28 Demonstrate an understanding of overdrive operation.
01.29 Demonstrate knowledge of internal engine components.
01.30 Describe electrical terms, magnetism, electrical current flow and Ohms' law.
01.31 Demonstrate an understanding of series circuits.
01.32 Demonstrate an understanding of parallel circuits.
01.33 Demonstrate an understanding of series-parallel circuits.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS--The student will be able to:

02.01 Use and apply basic electrical and electronic test equipment and meters.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow and resistance in a circuit or component with a multimeter. (ASE)
02.05 Locate an open circuit and a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions. (ASE)
02.08 Service and test batteries.
02.09 Remove and replace light bulbs. (ASE)
02.10 Test, remove and replace fuses and circuit breakers. (ASE)
02.11 Replace and test starters. (ASE)
02.12 Test and replace alternators.
02.13 Test, remove and replace regulators. (ASE)
02.14 Inspect and repair lighting systems. (ASE)
02.15 Diagnose, repair or replace turn signal and stoplight switches. (ASE)
02.16 Test and replace electrical system switches. (ASE)
02.17 Diagnose, repair or replace power window and power seat systems, including motors.
02.18 Diagnose and service windshield wiper/washer systems. (ASE)
02.19 Test and replace sending units. (ASE)

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS--The student will be able to:

03.01 Diagnose suspension problems.
03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
03.03 Diagnose steering problems.
03.04 Lubricate suspension, steering gear and linkage. (ASE)
03.05 Check manual steering gear fluid level. (ASE)
03.06 Inspect steering systems. (ASE)
03.07 Inspect suspension systems. (ASE)
03.08 Inspect and test shock absorbers.
03.09 Check power steering fluid level. (ASE)
03.10 Inspect, repair and replace tires and wheels.
03.11 Rotate wheels and tires. (ASE)
03.12 Balance wheels. (ASE)
03.13 Service wheel bearings and grease seals on non-drive axles/spindles. (ASE)
03.14 Remove and replace spindles and ball joints. (ASE)
03.15 Remove and replace shock absorbers and mountings. (ASE)
03.16 Measure and adjust torsion bar height. (ASE)
03.17 Remove and replace coil springs/torsion bars. (ASE)
03.18 Remove and replace control arms and bushings. (ASE)

03.19 Remove and replace steering linkage components.
03.20 Remove and replace steering dampers. (ASE)
03.21 Remove and replace rear suspension parts. (ASE)
03.22 Remove and replace manual/power steering gear assemblies.
03.23 Check two-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS:--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose combination valve malfunctions.
04.03 Perform operational inspections.
04.04 Inspect brake assemblies.
04.05 Remove and replace calipers and rotors. (ASE)
04.06 Refinish rotors. (ASE)
04.07 Rebuild calipers (ASE)
04.08 Refinish brake drums. (ASE)
04.09 Replace drum brake shoes and disc pads. (ASE)
04.10 Inspect and replace brake lines and hoses. (ASE)
04.11 Adjust brake shoes. (ASE).
04.12 Adjust parking brakes. (ASE)
04.13 Rebuild wheel cylinders. (ASE)
04.14 Remove and replace wheel cylinders. (ASE)
04.15 Bleed hydraulic brakes. (ASE)
04.16 Repair or replace parking brake cables and linkage. (ASE)
04.17 Remove and replace master cylinders. (ASE)
04.18 Remove and replace hydraulic power cylinders.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS:--The student will be able to:

05.01 Diagnose overheating problems.
05.02 Check radiator coolant level.
05.03 Test and add coolant. (ASE)
05.04 Pressure test cooling systems. (ASE)
05.05 Test radiator caps. (ASE)
05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
05.07 Remove, test and replace thermostats. (ASE)
05.08 Flush cooling systems and replace coolant.
05.09 Remove and replace radiators. (ASE)
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Flush air conditioning systems.
05.14 Discharge, evacuate and charge basic air conditioning systems. (ASE)
05.15 Leak test basic air conditioning systems. (ASE)
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems. (ASE)
05.19 Remove and replace engine fan clutches and electric cooling fan and controls.
05.20 Remove and replace blower motors. (ASE)
05.21 Remove and replace heater cores, control units and cables. (ASE)

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.

06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify and adopt acceptable work habits.
09.08 Demonstrate knowledge of how to make appropriate job changes.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Automotive Mechanics
PROGRAM NUMBER: 8709100

COURSE TITLE: Automotive Mechanics 1
COURSE NUMBER: 8709110

COURSE DESCRIPTION:

This course is designed to provide an introduction to automotive mechanics. It will include instruction in safety procedures, use of hand tools, related math, bench skills, use of repair and service manuals, concept of automotive systems and employability skills.

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vices and "C" Clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
01.05 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
01.06 Apply basic math skills.
01.07 Use and apply metric and English measurement skills.
01.08 Demonstrate an understanding of lubrication requirements.
01.09 Inspect, remove, replace and adjust all belts.
01.10 Perform auto safety inspection.
01.11 Demonstrate use of technical manuals, specification handbooks and charts.
01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster, camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
01.13 Demonstrate an understanding of the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm and control arm.
01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, power steering control valve and power steering fluid leaks.
01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
01.16 Demonstrate an understanding of disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
01.18 Demonstrate an understanding of basic heating and cooling systems.
01.19 Demonstrate an understanding of basic air conditioning systems.
01.20 Demonstrate knowledge of engine components.
01.21 Demonstrate an understanding of basic ignition and fuel systems.
01.22 Demonstrate an understanding of rear axle operation such as differential action; limited slip mechanisms; floating,

nonfloating and semifloating.
01.23 Demonstrate an understanding of drive shaft operation, drive shaft construction and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint, spline output and spline drive shaft.
01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
01.25 Demonstrate an understanding of clutch operation.
01.26 Demonstrate an understanding of clutch release mechanisms to include linkage and hydraulic.
01.27 Demonstrate an understanding of manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action and shift mechanisms.
01.28 Demonstrate an understanding of overdrive operation.
01.29 Demonstrate knowledge of internal engine components.
01.30 Describe electrical terms, magnetism, electrical current flow and Ohm's law.
01.31 Demonstrate an understanding of series circuits.
01.32 Demonstrate an understanding of parallel circuits.
01.33 Demonstrate an understanding of series-parallel circuits.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Automotive Mechanics	PROGRAM NUMBER:	8709100
COURSE TITLE:	Automotive Mechanics 2	COURSE NUMBER:	8709120

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive electrical systems including diagnosing, troubleshooting and repair.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS--The student will be able to:

02.01 Use and apply basic electrical and electronic test equipment and meters.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow and resistance in a circuit or component with a multimeter. (ASE)
02.05 Locate an open circuit and a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions. (ASE)
02.08 Service and test batteries.
02.09 Remove and replace light bulbs. (ASE)
02.10 Test, remove and replace fuses and circuit breakers. (ASE)
02.11 Replace and test starters. (ASE)
02.12 Test and replace alternators.
02.13 Test, remove and replace regulators. (ASE)
02.14 Inspect and repair lighting systems. (ASE)
02.15 Diagnose, repair or replace turn signal and stoplight switches. (ASE)
02.16 Test and replace electrical system switches. (ASE)
02.17 Diagnose, repair or replace power window and power seat systems,

including motors.
02.18 Diagnose and service windshield wiper/washer systems. (ASE)
02.19 Test and replace sending units. (ASE)

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Automotive Mechanics — PROGRAM NUMBER: 8709100

COURSE TITLE: Automotive Mechanics 3 — COURSE NUMBER: 8709130

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive suspension steering alignment and balance.

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS--The student will be able to:

03.01 Diagnose suspension problems.
03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
03.03 Diagnose steering problems.
03.04 Lubricate suspension, steering gear and linkage. (ASE)
03.05 Check manual steering gear fluid level. (ASE)
03.06 Inspect steering systems. (ASE)
03.07 Inspect suspension systems. (ASE)
03.08 Inspect and test shock absorbers.
03.09 Check power steering fluid level. (ASE)
03.10 Inspect, repair and replace tires and wheels.
03.11 Rotate wheels and tires. (ASE)
03.12 Balance wheels. (ASE)
03.13 Service wheel bearings and grease seals on non-drive axles/spindles. (ASE)
03.14 Remove and replace spindles and ball joints. (ASE)
03.15 Remove and replace shock absorbers and mountings. (ASE)
03.16 Measure and adjust torsion bar height. (ASE)
03.17 Remove and replace coil springs/torsion bars. (ASE)
03.18 Remove and replace control arms and bushings. (ASE)
03.19 Remove and replace steering linkage components.
03.20 Remove and replace steering dampers. (ASE)
03.21 Remove and replace rear suspension parts. (ASE)
03.22 Remove and replace manual/power steering gear assemblies.
03.23 Check two-wheel alignment.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Automotive Mechanics — PROGRAM NUMBER: 8709100

COURSE TITLE: Automotive Mechanics 4 — COURSE NUMBER: 8709140

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive brake systems service.

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS:--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose combination valve malfunctions.
04.03 Perform operational inspections.
04.04 Inspect brake assemblies.
04.05 Remove and replace calipers and rotors. (ASE)
04.06 Refinish rotors. (ASE)
04.07 Rebuild calipers (ASE)
04.08 Refinish brake drums. (ASE)
04.09 Replace drum brake shoes and disc pads. (ASE)
04.10 Inspect and replace brake lines and hoses. (ASE)
04.11 Adjust brake shoes. (ASE).
04.12 Adjust parking brakes. (ASE)
04.13 Rebuild wheel cylinders. (ASE)
04.14 Remove and replace wheel cylinders. (ASE)
04.15 bleed hydraulic brakes. (ASE)
04.16 Repair or replace parking brake cables and linkage. (ASE)
04.17 Remove and replace master cylinders. (ASE)
04.18 Remove and replace hydraulic power cylinders.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education	COURSE CREDIT: 1
PROGRAM TITLE: Automotive Mechanics	PROGRAM NUMBER: 8709100
COURSE TITLE: Automotive Mechanics 5	COURSE NUMBER: 8709150

COURSE DESCRIPTION:

This course will provide instruction in cooling, air conditioning and heating system service.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS:--The student will be able to:

05.01 Diagnose overheating problems.
05.02 Check radiator coolant level.
05.03 Test and add coolant. (ASE)
05.04 Pressure test cooling systems. (ASE)
05.05 Test radiator caps. (ASE)
05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
05.07 Remove, test and replace thermostats. (ASE)
05.08 Flush cooling systems and replace coolant.
05.09 Remove and replace radiators. (ASE)
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Flush air conditioning systems.
05.14 Discharge, evacuate and charge basic air conditioning systems. (ASE)
05.15 Leak test basic air conditioning systems. (ASE)
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems.

(ASE)
05.19 Remove and replace engine fan clutches and electric cooling fan and controls.
05.20 Remove and replace blower motors. (ASE)
05.21 Remove and replace heater cores, control units and cables. (ASE)

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify and adopt acceptable work habits.
09.08 Demonstrate knowledge of how to make appropriate job changes.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Service Management Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.080300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

_x_Postsecondary Vocational ___Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an automotive service supervisor, this program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; radiators; transmissions and carburetors; basic management concepts; troubleshooting skills; and servicing, maintaining and repairing all mechanical systems or gasoline and diesel powered automobiles including fuel, electrical, cooling, brake, drive, suspension and related systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: engine system performance; automotive accessories; and theory, fundamentals, service and rebuilding of engines, automatic and manual transmissions, drive trains, steering, suspension, brake and electrical systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is Associate Degree.

Student performance standards required for National Institute for Automotive Service Excellence (ASE) certification are identified with the initials ASE following the standard.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of automotive mechanics.
02. Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components.
03. Demonstrate proficiency in servicing steering, suspension and wheel systems.
04. Demonstrate proficiency in servicing automotive brake systems.
05. Demonstrate proficiency in servicing cooling, air conditioning and heating services.
06. Demonstrate proficiency in engine performance service.
07. Demonstrate proficiency in automatic transmission/trans-axle service.
08. Demonstrate proficiency in servicing manual drive trains and axles.
09. Demonstrate proficiency in engine repair service.
10. Demonstrate proficiency in management skills.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Automotive Service Management Technology POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers,special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vises and "C" clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
01.05 Use and maintain power tools such as drills, bench grinders, drill press, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
01.06 Apply basic math skills.
01.07 Use and apply metric and English measurement skills.
01.08 Demonstrate an understanding of lubrication requirements.
01.09 Inspect, remove, replace and adjust all belts.
01.10 Perform auto safety inspection.
01.11 Demonstrate use of technical manuals, specification handbooks and charts.
01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster, camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
01.13 Demonstrate an understanding of the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm and control arm.
01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, power steering control valve and power steering fluid leaks.
01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
01.16 Demonstrate an understanding of disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
01.18 Demonstrate an understanding of basic heating and cooling systems.
01.19 Demonstrate an understanding of basic air conditioning systems.
01.20 Demonstrate knowledge of engine components.
01.21 Demonstrate an understanding of basic ignition and fuel systems.
01.22 Demonstrate an understanding of rear axle operation such as differential action; limited slip mechanisms; floating, non-floating and semi-floating.
01.23 Demonstrate an understanding of drive shaft operation, drive shaft construction and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint, spline output and spline drive shaft.
01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
01.25 Demonstrate an understanding of clutch operation.

01.26 Demonstrate an understanding of clutch release mechanisms to include linkage and hydraulic.
01.27 Demonstrate an understanding of manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action and shift mechanisms.
01.28 Demonstrate an understanding of overdrive operation.
01.29 Demonstrate knowledge of internal engine components.
01.30 Describe electrical terms, magnetism, electrical current flow and Ohm's law.
01.31 Demonstrate an understanding of series circuits.
01.32 Demonstrate an understanding of parallel circuits.
01.33 Demonstrate an understanding of series-parallel circuits.
01.34 Apply basic welding skills related to the automobile industry.
01.35 Demonstrate an understanding of advanced electronics concepts.
01.36 Demonstrate an understanding of electronic schematic diagrams and diagnostic techniques.
01.37 Demonstrate an understanding of electrical/electronic wire repair procedures.
01.38 Demonstrate an understanding of electronic semiconductor concepts and components.
01.39 Demonstrate an understanding of electronic transistor concepts and components.
01.40 Demonstrate an understanding of electronic microprocessor concepts, functions and components.
01.41 Adjust door hinges and striker plates.
01.42 Locate and correct rattles and noises.
01.43 Install door moldings.
01.44 Remove and replace electric window regulators.
01.45 Adjust electric window regulators.
01.46 Install air shocks.
01.47 Install C.B.'s and radios.
01.48 Touch up paint.
01.49 Lubricate hinges.
01.50 Adjust headlights. (ASE)
01.51 Inspect and replace passenger restraints.
01.52 Check vehicle visibility.
01.53 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS--The student will be able to:

02.01 Use and apply basic electrical and electronic test equipment and meters.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow and resistance in a circuit or component with a multimeter. (ASE)
02.05 Locate an open circuit and a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions. (ASE)
02.08 Service and test batteries.
02.09 Remove and replace light bulbs. (ASE)
02.10 Test, remove and replace fuses and circuit breakers. (ASE)
02.11 Replace and test starters. (ASE)
02.12 Test and replace alternators.
02.13 Test, remove and replace regulators. (ASE)
02.14 Inspect and repair lighting systems. (ASE)
02.15 Diagnose, repair or replace turn signal and stoplight switches. (ASE)
02.16 Test and replace electrical system switches. (ASE)
02.17 Diagnose, repair or replace power window and power seat systems,

including motors.
02.18 Diagnose and service windshield wiper/washer systems. (ASE)
02.19 Test and replace sending units. (ASE)
02.20 Diagnose engine malfunctions.
02.21 Inspect, remove and replace alternator belts.
02.22 Overhaul starters. (ASE)
02.23 Diagnose, repair or replace horn systems. (ASE)
02.24 Diagnose, repair or replace clock systems.
02.25 Diagnose, repair or replace warning buzzer.
02.26 Test and replace instrument panel units. (ASE)
02.27 Diagnose and service cruise control systems. (ASE)
02.28 Check, remove and replace radios. (ASE)
02.29 Test and repair automotive alarm system components. (ASE)

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS--The student will be able to:

03.01 Diagnose suspension problems.
03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
03.03 Diagnose steering problems.
03.04 Lubricate suspension, steering gear and linkage. (ASE)
03.05 Check manual steering gear fluid level. (ASE)
03.06 Inspect steering systems. (ASE)
03.07 Inspect suspension systems. (ASE)
03.08 Inspect and test shock absorbers.
03.09 Check power steering fluid level. (ASE)
03.10 Inspect, repair and replace tires and wheels.
03.11 Rotate wheels and tires. (ASE)
03.12 Balance wheels, (ASE)
03.13 Service wheel bearings and grease seals on nondrive axles/spindles. (ASE)
03.14 Remove and replace spindles and ball joints. (ASE)
03.15 Remove and replace shock absorbers and mountings. (ASE)
03.16 Measure and adjust torsion bar height. (ASE)
03.17 Remove and replace coil springs/torsion bars. (ASE)
03.18 Remove and replace control arms and bushings. (ASE)
03.19 Remove and replace steering linkage components.
03.20 Remove and replace steering dampers. (ASE)
03.21 Remove and replace steering dampers. (ASE)
03.22 Remove and replace manual/power steering gear assemblies.
03.23 Check two-wheel alignment.
03.24 Rebuild MacPherson type struts. (ASE)
03.25 Overhaul recirculating ball manual gears.
03.26 Rebuild rack-and-pinion manual gears. (ASE)
03.27 Remove and replace power steering pumps. (ASE)
03.28 Rebuild power steering pumps.
03.29 Overhaul integral steering gears.
03.30 Rebuild rack-and-pinion power steering assembly. (ASE)
03.31 Check four-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose combination valve malfunctions.
04.03 Perform operational inspections.
04.04 Inspect brake assemblies.
04.05 Remove and replace calipers and rotors. (ASE)
04.06 Refinish rotors. (ASE)
04.07 Rebuild calipers. (ASE)
04.08 Refinish brake drums. (ASE)
04.09 Replace drum brake shoes and disc pads. (ASE)

04.10 Inspect and replace brake lines and hoses. (ASE)
04.11 Adjust brake shoes. (ASE)
04.12 Adjust parking brakes. (ASE)
04.13 Rebuild wheel cylinders. (ASE)
04.14 Remove and replace wheel cylinders, (ASE)
04.15 Bleed hydraulic brakes. (ASE)
04.16 Repair or replace parking brake cables and linkage. (ASE)
04.17 Remove and replace master cylinders. (ASE)
04.18 Remove and replace hydraulic power cylinders.
04.19 Flush brake systems. (ASE)
04.20 Service and repair power assist and brake control systems.
04.21 Service and repair front and rear disc brakes.
04.22 Replace hydraulic brake boosters. (ASE)
04.23 Inspect, diagnose and repair anti-locking brake systems.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS--The student will be able to:

05.01 Diagnose overheating problems.
05.02 Check radiator coolant level.
05.03 Test and add coolant. (ASE)
05.04 Pressure test cooling systems.(ASE)
05.05 Test radiator caps. (ASE)
05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
05.07 Remove, test and replace thermostats. (ASE)
05.08 Flush cooling systems and replace coolant.
05.09 Remove and replace radiators. (ASE)
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Inspect and pressure test basic air conditioning systems.
05.14 Discharge, evacuate and charge basic air conditioning systems. (ASE)
05.15 Leak test basic air conditioning systems. (ASE)
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems. (ASE)
05.19 Remove and replace engine fan clutches and electric cooling fan and controls.
05.20 Remove and replace blower motors. (ASE)
05.21 Remove and replace heater cores, control units and cables. (ASE)
05.22 Diagnose and repair electronic air conditioning controls.
05.23 Remove and replace air conditioning compressor shaft seals.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove and replace points and condensers. (ASE)
06.06 Remove and replace distributor. (ASE)
06.07 Check the distributor advance in a vehicle.
06.08 Remove distributor; inspect, test and service.
06.09 Inspect and test primary circuits.
06.10 Remove and replace coils.
06.11 Remove and replace ignition switches and resistors.
06.12 Inspect, remove and replace ignition wires, caps and rotors.
06.13 Remove, gap and replace spark plugs. (ASE)
06.14 Service electronic ignition systems.

06.15 Service air cleaners. (ASE)
06.16 Inspect, remove and replace fuel filters. (ASE)
06.17 Measure fuel flow and pressure.
06.18 Remove and replace fuel lines. (ASE)
06.19 Remove and replace fuel pumps. (ASE)
06.20 Adjust idle speed.
06.21 Clean and adjust chokes. (ASE)
06.22 Inspect, remove and replace manifold control valves.
06.23 Remove and replace fuel injection system filters.
06.24 Set idle speed to specifications.
06.25 Remove and replace fuel injectors. (ASE)
06.26 Service throttle body fuel injection systems.
06.27 Service ported fuel injection systems.
06.28 Service positive crankcase ventilation (PCV) systems. (ASE)
06.29 Service evaporative control systems. (ASE)
06.30 Service thermostatic air cleaners. (ASE)
06.31 Service air-injection systems. (ASE)
06.32 Service exhaust gas recirculation (EGR) systems. (ASE)
06.33 Inspect, remove and replace catalytic converter. (ASE)
06.34 Diagnose mechanical, ignition and fuel emission problems.
06.35 Inspect, remove and replace exhaust system components. (ASE)
06.36 Inspect, remove and replace catalytic converters. (ASE)
06.37 Perform cylinder leakage tests.
06.38 Diagnose and correct malfunctions in computer control systems.
06.39 Diagnose, test and replace on-board computer controls.
06.40 Diagnose, service and replace computerized sensors.
06.41 Clean and overhaul electronically controlled carburetor systems. (ASE)
06.42 Remove and replace turbo chargers. (ASE)
06.43 Rebuild fuel injection pump. (ASE)
06.44 Check and adjust turbo charger waste gates. (ASE)
06.45 Test exhaust emissions using a four gas analyzer.
06.46 Service diesel injectors.
06.47 Remove and replace diesel engine fuel filters.
06.48 Check and adjust injection pump timing.
06.49 Remove and replace injection pumps.
06.50 Check and adjust idle and maximum speeds.
06.51 Test and service preheating systems.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

07.01 Performance test automatic transmissions.
07.02 Change transmission oil and filter. (ASE)
07.03 Adjust linkage from the engine.
07.04 Adjust shift linkage. (ASE)
07.05 Adjust neutral safety switches.
07.06 Remove and replace external gaskets and seals.
07.07 Test vacuum shift modulator. (ASE)
07.08 Adjust bands. (ASE)
07.09 Pressure flush transmission cooler assemblies.
07.10 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock up and shift problems.
07.11 Diagnose, repair and replace trans-axles.
07.12 Pressure test transmissions in vehicles. (ASE)
07.13 Test the electrical controls of an automatic clutch converter.
07.14 Service governors.
07.15 Service valve bodies.
07.16 Rebuild transmission assemblies (ASE)
07.17 Rebuild automatic trans-axle.
07.18 Pressure flush converter assemblies.
07.19 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The student will be able to:

08.01 Diagnose drive line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, universal joints and center bearings.
08.04 Lubricate universal joints. (ASE)
08.05 Remove and replace transmission mounts. (ASE)
08.06 Remove and replace transmissions.
08.07 Adjust shift linkage. (ASE)
08.08 Adjust clutches. (ASE)
08.09 Remove and replace extension housing seals and bushings. (ASE)
08.10 Remove and replace clutches, release bearings, linkage and pilot bearings.
08.11 Rebuild or replace clutch master and slave cylinders. (ASE)
08.12 Remove and replace universal joints. (ASE)
08.13 Remove and replace speedometer gears and service speedometer cables.(ASE)
08.14 Remove and replace drive axle bearings and seals. (ASE)
08.15 Service and repair differentials. (ASE)
08.16 Remove and replace trans-axle assemblies.
08.17 Adjust trans-axle shifting controls.
08.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
08.19 Inspect, remove and replace constant-velocity universal joints.
08.20 Service manual transmissions to include overdrives. (ASE)
08.21 Overhaul trans-axle assemblies. (ASE)

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

09.01 Clean engines. (ASE)
09.02 Remove and replace motor mounts.
09.03 Check valve guides for wear.
09.04 Reface valves and seats.
09.05 Perform cylinder balance tests.
09.06 Perform cylinder compression tests.
09.07 Perform cylinder leakage tests. (ASE)
09.08 Determine source(s) of oil/coolant loss.
09.09 Determine source(s) of excess noise. (ASE)
09.10 Determine cause(s) of overheating. (ASE)
09.11 Check the engine oil pressure.
09.12 Remove and replace core plugs. (ASE)
09.13 Inspect, remove and replace flywheels and ring gears.
09.14 Remove and replace engine assemblies. (ASE)
09.15 Remove and replace oil pans. (ASE)
09.16 Remove and replace oil pumps.
09.17 Clean cylinder blocks, oil passages and pistons.
09.18 Inspect blocks for warpage. (ASE)
09.19 Measure and inspect engine components for proper tolerances.
09.20 Remove and replace crankshafts, mains and rod bearings. (ASE)
09.21 Remove and replace camshafts and bushings. (ASE)
09.22 Remove and replace pistons and rings. (ASE)
09.23 Remove ridges and deglaze cylinder walls.
09.24 Remove and replace front and rear oil seals.
09.25 Remove and replace intake and exhaust manifolds. (ASE)
09.26 Remove, clean, inspect and replace cylinder heads; and inspect heads for cracks and warpage.(ASE)
09.27 Test and replace hydraulic lifters.
09.28 Remove and replace timing chains, belts and gears. (ASE)
09.29 Test valve springs. (ASE)
09.30 Adjust valve lifters. (ASE)

09.31 Replace rocker arm assemblies. (ASE)
09.32 Change oil and oil filters.

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS--The student will be able to:

10.01 Write and process work orders.
10.02 Process parts warranties and labor claims.
10.03 Process merchandise returns.
10.04 Accept and return cores/cards for rebuilt and exchange items.
10.05 Select and care for shop materials.
10.06 Use supervisory techniques for hiring and firing.
10.07 Prepare technical reports.
10.08 Perform business and technical computations.
10.09 Evaluate productivity.
10.10 Develop a customer relations plan.
10.11 Plan service facilities.
10.12 Schedule production.
10.13 Plan, organize, activate and control a service operation.
10.14 Perform auto safety inspections.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify and adopt acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Technology

CODE NUMBER: Secondary _______ Postsecondary I470604

Florida CIP 0647.060400

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other30-31

CERTIFICATION COVERAGE: AUTO MECH @ 7 G AUTO IND @ 7 G GASENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive technicians, this program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic management; troubleshooting skills; servicing, maintaining and repairing all mechanical systems of gasoline and diesel powered automobiles (fuel, electrical, cooling, brake, suspension, drive train, etc.); and diagnosis of malfunctions in engines, their systems, carburetors and radiators and transmissions.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: engine system performance; automotive accessories; and theory, fundamentals, service and rebuilding of engines, automatic and manual transmissions, drive trains, steering, suspension, brake and electrical systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is:

Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours when content from the Florida common core automotive service program (Automotive Mechanics and Advanced Automotive Mechanics) is included.

Student performance standards required for National Institute for Automotive Service Excellence (ASE) certification are identified with the initials ASE following the standard.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of automotive mechanics.
02. Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components.
03. Demonstrate proficiency in servicing steering, suspension and wheel systems.
04. Demonstrate proficiency in servicing automotive brake systems.
05. Demonstrate proficiency in servicing cooling, air conditioning and heating services.
06. Demonstrate proficiency in engine performance service.
07. Demonstrate proficiency in automatic transmission/trans-axle service.
08. Demonstrate proficiency in servicing manual drive trains and axles.
09. Demonstrate proficiency in engine repair service.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: __________

PROGRAM TITLE: Automotive Technology POSTSECONDARY NUMBER: I470604

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vises and "C" clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
01.05 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
01.06 Apply basic math skills.
01.07 Use and apply metric and English measurement skills.
01.08 Demonstrate an understanding of lubrication requirements.
01.09 Inspect, remove, replace and adjust all belts.
01.10 Perform auto safety inspection.
01.11 Demonstrate use of technical manuals, specification handbooks and charts.
01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster, camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
01.13 Demonstrate an understanding of the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm and control arm.
01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, power steering control valve and power steering fluid leaks.
01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
01.16 Demonstrate an understanding of disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
01.18 Demonstrate an understanding of basic heating and cooling systems.
01.19 Demonstrate an understanding of basic air conditioning systems.
01.20 Demonstrate knowledge of engine components.
01.21 Demonstrate and understanding of basic ignition and fuel systems.
01.22 Demonstrate an understanding of rear axle operation such as differential action; limited slip mechanisms; floating, nonfloating and semifloating.
01.23 Demonstrate an understanding of drive shaft operation, drive shaft construction and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint, spline output and spline drive shaft.
01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
01.25 Demonstrate an understanding of clutch operation.

01.26 Demonstrate an understanding of clutch release mechanisms to include linkage and hydraulic.
01.27 Demonstrate an understanding of manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action and shift mechanisms.
01.28 Demonstrate an understanding of overdrive operation.
01.29 Demonstrate knowledge of internal engine components.
01.30 Describe electrical terms, magnetism, electrical current flow and Ohm's law.
01.31 Demonstrate an understanding of series circuits.
01.32 Demonstrate an understanding of parallel circuits.
01.33 Demonstrate an understanding of series-parallel circuits.
01.34 Apply basic welding skills related to the automobile industry.
01.35 Demonstrate an understanding of advanced electronics concepts.
01.36 Demonstrate an understanding of electronic schematic diagrams and diagnostic techniques.
01.37 Demonstrate an understanding of electrical/electronic wire repair procedures.
01.38 Demonstrate an understanding of electronic semiconductor concepts and components.
01.39 Demonstrate an understanding of electronic transistor concepts and components.
01.40 Demonstrate an understanding of electronic microprocessor concepts, functions and components.
01.41 Adjust door hinges and striker plates.
01.42 Locate and correct rattles and noises.
01.43 Install door moldings.
01.44 Remove and replace electric window regulators.
01.45 Adjust, electric window regulators.
01.46 Install air shocks.
01.47 Install C.B.'s and radios.
01.48 Touch up paint.
01.49 Lubricate hinges.
01.50 Adjust headlights. (ASE)
01.51 Inspect and replace passenger restraints.
01.52 Check vehicle visibility.
01.53 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS--The student will be able to:

02.01 Use and apply basic electrical and electronic test equipment and meters.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow and resistance in a circuit or component with a multimeter.(ASE)
02.05 Locate an open circuit and a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions. (ASE)
02.08 Service and test batteries.
02.09 Remove and replace light bulbs. (ASE)
02.10 Test, remove and replace fuses and circuit breakers. (ASE)
02.11 Replace and test starters. (ASE)
02.12 Test and replace alternators.
02.13 Test, remove and replace regulators. (ASE)
02.14 Inspect and repair lighting systems. (ASE)
02.15 Diagnose, repair or replace turn signal and stoplight switches. (ASE)
02.16 Test and replace electrical system switches. (ASE)
02.17 Diagnose, repair or replace power window and power seat systems,

including motors.
02.18 Diagnose and service windshield wiper/washer systems. (ASE)
02.19 Test and replace sending units. (ASE)
02.20 Diagnose engine malfunctions.
02.21 Inspect, remove and replace alternator belts.
02.22 Overhaul starters. (ASE)
02.23 Diagnose, repair or replace horn systems. (ASE)
02.24 Diagnose, repair or replace clock systems.
02.25 Diagnose, repair or replace warning buzzer.
02.26 Test and replace instrument panel units. (ASE)
02.27 Diagnose and service cruise control systems. (ASE)
02.28 Check, remove and replace radios. (ASE)
02.29 Test and repair automotive alarm system components. (ASE)

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS--The student will be able to:

03.01 Diagnose suspension problems.
03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
03.03 Diagnose steering problems.
03.04 Lubricate suspension, steering gear and linkage. (ASE)
03.05 Check manual steering gear fluid level. (ASE)
03.06 Inspect steering systems. (ASE)
03.07 Inspect suspension systems. (ASE)
03.08 Inspect and test shock absorbers.
03.09 Check power steering fluid level. (ASE)
03.10 Inspect, repair and replace tires and wheels.
03.11 Rotate wheels and tires. (ASE)
03.12 Balance wheels. (ASE)
03.13 Service wheel bearings and grease seals on nondrive axles/spindles. (ASE)
03.14 Remove and replace spindles and ball joints. (ASE)
03.15 Remove and replace shock absorbers and mountings. (ASE)
03.16 Measure and adjust torsion bar height. (ASE)
03.17 Remove and replace coil springs/torsion bars. (ASE)
03.18 Remove and replace control arms and bushings. (ASE)
03.19 Remove and replace steering linkage components.
03.20 Remove and replace steering dampers. (ASE)
03.21 Remove and replace rear suspension parts. (ASE)
03.22 Remove and replace manual/power steering gear assemblies.
03.23 Check two-wheel alignment.
03.24 Rebuild MacPherson type struts. (ASE)
03.25 Overhaul recirculating ball manual gears.
03.26 Rebuild rack and pinion manual gears. (ASE)
03.27 Remove and replace power steering pumps. (ASE)
03.28 Rebuild power steering pumps.
03.29 Overhaul integral steering gears.
03.30 Rebuild rack and pinion power steering assembly. (ASE)
03.31 Check four-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose combination valve malfunctions.
04.03 Perform operational inspections.
04.04 Inspect brake assemblies.
04.05 Remove and replace calipers and rotors. (ASE)
04.06 Refinish rotors. (ASE)
04.07 Rebuild calipers. (ASE)
04.08 Refinish brake drums. (ASE)
04.09 Replace drum brake shoes and disc pads.(ASE)

04.10 Inspect and replace brake lines and hoses. (ASE)
04.11 Adjust brake shoes. (ASE)
04.12 Adjust parking brakes. (ASE)
04.13 Rebuild wheel cylinders. (ASE)
04.14 Remove and replace wheel cylinders. (ASE)
04.15 Bleed hydraulic brakes. (ASE)
04.16 Repair or replace parking brake cables and linkage. (ASE)
04.17 Remove and replace master cylinders. (ASE)
04.18 Remove and replace hydraulic power cylinders.
04.19 Flush brake systems. (ASE)
04.20 Service and repair power assist and brake control systems.
04.21 Service and repair front and rear disc brakes.
04.22 Replace hydraulic brake boosters. (ASE)
04.23 Inspect, diagnose and repair anti-locking brake systems.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS--The student will be able to:

05.01 Diagnose overheating problems.
05.02 Check radiator coolant level.
05.03 Test and add coolant. (ASE)
05.04 Pressure test cooling systems. (ASE)
05.05 Test radiator caps. (ASE)
05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
05.07 Remove, test and replace thermostats. (ASE)
05.08 Flush cooling systems and replace coolant.
05.09 Remove and replace radiators. (ASE)
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Flush air conditioning systems.
05.14 Discharge, evacuate and charge basic air conditioning systems. (ASE)
05.15 Leak test basic air conditioning systems. (ASE)
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems. (ASE)
05.19 Remove and replace components in basic air conditioning systems. (ASE)
05.20 Remove and replace blower motors. (ASE)
05.21 Remove and replace heater cores, control units and cables. (ASE)
05.22 Diagnose and repair electronic air conditioning controls.
05.23 Remove and replace air conditioning compressor shaft seals.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove and replace points and condensers. (ASE)
06.06 Remove and replace distributor. (ASE)
06.07 Check the distributor advance in a vehicle.
06.08 Remove distributor; inspect, test and service.
06.09 Inspect and test primary circuits.
06.10 Remove and replace coils.
06.11 Remove and replace ignition switches and resistors.
06.12 Inspect, remove and replace ignition wires, caps and rotors.
06.13 Remove, gap and replace spark plugs. (ASE)
06.14 Service electronic ignition systems.

06.15 Service air cleaners. (ASE)
06.16 Inspect, remove and replace fuel filters. (ASE)
06.17 Measure fuel flow and pressure.
06.18 Remove and replace fuel lines. (ASE)
06.19 Remove and replace fuel pumps. (ASE)
06.20 Adjust idle speed.
06.21 Clean and adjust chokes. (ASE)
06.22 Inspect, remove and replace manifold control valves.
06.23 Remove and replace fuel injection system filters.
06.24 Set idle speed to specifications.
06.25 Remove and replace fuel injectors. (ASE)
06.26 Service throttle body fuel injection systems.
06.27 Service ported fuel injection systems.
06.28 Service positive crankcase ventilation (PCV) systems. (ASE)
06.29 Service evaporative control systems. (ASE)
06.30 Service thermostatic air cleaners. (ASE)
06.31 Service air-injection systems. (ASE)
06.32 Service exhaust gas recirculation (EGR) systems. (ASE)
06.33 Inspect, remove and replace catalytic converter. (ASE)
06.34 Diagnose mechanical, ignition and fuel emission problems.
06.35 Inspect, remove and replace exhaust system components. (ASE)
06.36 Inspect, remove and replace catalytic converters. (ASE)
06.37 Perform cylinder leakage tests.
06.38 Diagnose and correct malfunctions in computer control systems.
06.39 Diagnose, test and replace on-board computer controls.
06.40 Diagnose, service and replace computerized sensors.
06.41 Clean and overhaul electronically controlled carburetor systems. (ASE)
06.42 Remove and replace turbo chargers. (ASE)
06.43 Rebuild fuel injection pump. (ASE)
06.44 Check and adjust turbo charger waste gates. (ASE)
06.45 Test exhaust emissions using a four gas analyzer.
06.46 Service diesel injectors.
06.47 Remove and replace diesel engine fuel filters.
06.48 Check and adjust injection pump timing.
06.49 Remove and replace injection pumps.
06.50 Check and adjust idle and maximum speeds.
06.51 Test and service preheating systems.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

07.01 Performance test automatic transmissions.
07.02 Change transmission oil and filter. (ASE)
07.03 Adjust linkage from the engine.
07.04 Adjust shift linkage. (ASE)
07.05 Adjust neutral safety switches.
07.06 Remove and replace external gaskets and seals.
07.07 Test vacuum shift modulator. (ASE)
07.08 Adjust bands. (ASE)
07.09 Pressure flush transmission cooler assemblies.
07.10 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock up and shift problems.
07.11 Diagnose, repair and replace trans-axles.
07.12 Pressure test transmissions in vehicles. (ASE)
07.13 Test the electrical controls of an automatic clutch converter.
07.14 Service governors.
07.15 Service valve bodies.
07.16 Rebuild transmission assemblies. (ASE)
07.17 Rebuild automatic trans-axle.
07.18 Pressure flush converter assemblies.
07.19 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The student will be able to:

08.01 Diagnose drive line problems
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, universal joints and center bearings.
08.04 Lubricate universal joints. (ASE)
08.05 Remove and replace transmission mounts. (ASE)
08.06 Remove and replace transmissions.
08.07 Adjust shift linkage. (ASE)
08.08 Adjust clutches. (ASE)
08.09 Remove and replace extension housing seals and bushings. (ASE)
08.10 Remove and replace clutches, release bearings, linkage and pilot bearings.
08.11 Rebuild or replace clutch master and slave cylinders. (ASE)
08.12 Remove and replace universal joints. (ASE)
08.13 Remove and replace speedometer gears and service speedometer cables. (ASE)
08.14 Remove and replace drive axle bearings and seals. (ASE)
08.15 Service and repair differentials. (ASE)
08.16 Remove and replace trans-axle assemblies.
08.17 Adjust trans-axle shifting controls.
08.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
08.19 Inspect, remove and replace constant-velocity universal joints.
08.20 Service manual transmissions to include overdrives. (ASE)
08.21 Overhaul trans-axle assemblies. (ASE)

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

09.01 Clean engines. (ASE)
09.02 Remove and replace motor mounts.
09.03 Check valve guides for wear.
09.04 Reface valves and seats.
09.05 Perform cylinder balance tests.
09.06 Perform cylinder compression tests.
09.07 Perform cylinder leakage tests. (ASE)
09.08 Determine source(s) of oil/coolant loss.
09.09 Determine source(s) of excess noise. (ASE)
09.10 Determine cause(s) of overheating. (ASE)
09.11 Check the engine oil pressure.
09.12 Remove and replace core plugs. (ASE)
09.13 Inspect, remove and replace flywheels and ring gears.
09.14 Remove and replace engine assemblies. (ASE)
09.15 Remove and replace oil pans. (ASE)
09.16 Remove and replace oil pumps.
09.17 Clean cylinder blocks, oil passages and pistons.
09.18 Inspect blocks for warpage. (ASE)
09.19 Measure and inspect engine components for proper tolerances.
09.20 Remove and replace crankshafts, mains and rod bearings. (ASE)
09.21 Remove and replace camshafts and bushings. (ASE)
09.22 Remove and replace pistons and rings. (ASE)
09.23 Remove ridges and deglaze cylinder walls.
09.24 Remove and replace front and rear oil seals.
09.25 Remove and replace intake and exhaust manifolds. (ASE)
09.26 Remove, clean, inspect and replace cylinder heads; and inspect heads for cracks and warpage. (ASE)
09.27 Test and replace hydraulic lifters.
09.28 Remove and replace timing chains, belts and gears. (ASE)
09.29 Test valve springs. (ASE)

09.30 Adjust valve lifters. (ASE)
09.31 Replace rocker arm assemblies. (ASE)
09.32 Change oil and oil filters.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer,supervisor or other employees.
13.07 Identify and adopt acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Automotive Upholstery and Trim

CODE NUMBER: Secondary _______ Postsecondary I480313

Florida CIP 0648.030301

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AUTO UPH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as upholsterers (89508698), automobile upholsterers (780.381-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, operating sewing machine, installing carpeting and lining, upholstering door panels, arm rests, seats and accessories, installing headliners and accessories, fitting tonneau covers, installing convertible and vinyl tops, customizing vehicles and performing shop management functions.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in sewing, design and layout, using shop and cutting tools, fabricating and installing seat covers, trim and tops, and sales consultant skills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic upholstery and trim skills.
02. Install automotive carpet.
03. Install trunk lining.
04. Re-upholster door panels and arm rests.
05. Remove and install headliners and accessories.
06. Repair, repad, and re-upholster dashboards.
07. Re-upholster seats.
08. Fabricate and fit tonneau covers.
09. Remove and install convertible top.
10. Remove and install vinyl/landau tops.
11. Customize vehicles.
12. Perform business management skills.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial   SECONDARY NUMBER: ____________

PROGRAM TITLE: Automotive Upholstery and Trim   POSTSECONDARY NUMBER: I480313

01.0 APPLY BASIC UPHOLSTERY AND TRIM SKILLS--The student will be able to:

01.01 Apply communication and leadership techniques.
01.02 Apply human relations skills.
01.03 Identify safety procedures
01.04 Apply measuring skills.
01.05 Identify shop tools and equipment.
01.06 Identify shop supplies and hardware.
01.07 Identify procedures for operating walking foot machine.
01.08 Apply basic sewing techniques.
01.09 Apply advanced sewing techniques.
01.10 Select design and type of fabric.
01.11 Perform detailing skills.

02.0 INSTALL AUTOMOTIVE CARPET--The student will be able to:

02.01 Select carpet.
02.02 Install carpet in automobiles/trucks.
02.03 Install carpet in vans.
02.04 Install carpet in imported/sports cars.

03.0 INSTALL TRUCK LINING--The student will be able to:

03.01 Install truck lining.
03.02 Install truck carpet.

04.0 RE-UPHOLSTER DOOR PANELS AND ARM REST--The student will be able to:

04.01 Remove door panels.
04.02 Re-upholster arm rest.
04.03 Identify door panels and accessories.
04.04 Upholster door panels.
04.05 Install door panels.

05.0 REMOVE AND INSTALL HEADLINERS AND ACCESSORIES--The student will be able to:

05.01 Remove headliners and accessories.
05.02 Install molded headliners and accessories.

06.0 REPAIR, RE-PAD AND RE-UPHOLSTER DASHBOARD--The student will be able to:

06.01 Repair dashboard.
06.02 Re-pad dashboard.
06.03 Re-upholster dashboard.

07.0 RE-UPHOLSTER SEATS--The student will be able to:

07.01 Remove seat unit.
07.02 Repair frame unit.
07.03 Re-upholster seat.
07.04 Re-upholster head rest.
07.05 Install seats.
07.06 Install seats in sports cars.
07.07 Install backrest trim.

07.08 Install seats with backrest.
07.09 Install ready-made seat covers.

08.0 FABRICATE AND FIT TONNEAU COVERS--The student will be able to.

08.01 Select tonneau covering.
08.02 Fabricate tonneau covers.
08.03 Fit tonneau covers.

09.0 REMOVE AND INSTALL CONVERTIBLE TOP--The student will be able to:

09.01 Select convertible top.
09.02 Remove convertible top.
09.03 Install convertible top.
09.04 Install rear window unit.
09.05 Fabricate and install convertible well.
09.06 Install top pad.
09.07 Fabricate and install convertible boot.

10.0 REMOVE AND INSTALL VINYL/LANDAU TOPS--The student will be able to:

10.01 Identify types of vinyl/landau installations.
10.02 Select vinyl/landau top covers.
10.03 Remove vinyl/landau top.
10.04 Install vinyl/landau top.

11.0 CUSTOMIZING VEHICLES--The student will be able to:

11.01 Customize seats.
11.02 Customize carpet.
11.03 Customize headliner.
11.04 Customize panel.
11.05 Customize dashboard.
11.06 Customize package tray.
11.07 Customize convertible top and accessories.
11.08 Customize exterior.
11.09 Customize car cover.
11.10 Customize tire covers.
11.11 Customize miscellaneous body parts.
11.12 Install sun/T-top.

12.0 PERFORMING BUSINESS MANAGEMENT FUNCTIONS--The student will be able to:

12.01 Perform sales consulting duties.
12.02 Estimate job costs.
12.03 Perform business practices.
12.04 Use sample fabric/material books.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Autotronics

CODE NUMBER: Secondary ______ Postsecondary I470614

Florida CIP 0647.060401

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 Postsecondary Adult Vocational x

___Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ELECTRONIC @ 7G AUTO MECH @ 7G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as autotronics technicians (620.261-010). This program also provides supplemental training for persons previously or currently employed in this occupations.

This program includes selected competencies of the common core electronics program and others uniquely automotive.

The course content will include the following: direct current (DC); alternating current (AC), analog, relay, delay and time delay circuits; solid-state and digital devices, distribution, timing and control systems; microprocessors; industrial power supplies; transformers; DC and AC motors; digital motor controls; manual controllers; magnetic controllers and starters; pressure and strain measurements; temperature, photoelectric liquid level a process control; line diagrams and logic functions; gas and humidity sensing; and telemetry.

The course content should also include training in communication skills, leadership skills, human relations and employability skills, and safe efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student including the core is 1800 hours. This program provides the specialized technical content for the Automotive Service Management Technology (Autotronics Endorsement).

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01.0 Demonstrate a working knowledge of laboratory practices.
02.0 Demonstrate a working knowledge of direct current circuits.
03.0 Demonstrate a working knowledge of alternating current circuits.
04.0 Demonstrate a working knowledge of dual trace oscilloscopes.
05.0 Demonstrate a working knowledge of semi-conductor devices.
06.0 Demonstrate a working knowledge of integrated circuits.
07.0 Demonstrate a working knowledge of digital circuits.
08.0 Demonstrate a working knowledge of microprocessor fundamentals.
09.0 Demonstrate a working knowledge of electronic engine controls.
10.0 Demonstrate a working knowledge of electronic control module input and output devices and their functions.
11.0 Demonstrate a working knowledge of troubleshooting electronic control module systems.
12.0 Demonstrate a working knowledge of system operation.
13.0 Demonstrate a working knowledge of system input devices.
14.0 Demonstrate a working knowledge of system output devices.
15.0 Demonstrate a working knowledge of system diagnosis and repair.
16.0 Demonstrate a working knowledge of computer output displays.
17.0 Demonstrate a working knowledge of electronic instrumentation systems.
18.0 Demonstrate a working knowledge of theft deterrent systems.
19.0 Demonstrate a working knowledge of trip computer and trip monitor systems.
20.0 Demonstrate a working knowledge of windshield wiper and washer systems.
21.0 Demonstrate a working knowledge of cruise control systems.
22.0 Demonstrate a working knowledge of voice alert systems.
23.0 Demonstrate a working knowledge of audio systems.
24.0 Demonstrate a working knowledge of guide-matic and twilight sentinel systems.
25.0 Demonstrate a working knowledge of climate control systems.
26.0 Demonstrate a working knowledge of electronic seats with memory.
27.0 Demonstrate a working knowledge of fiber optics.
28.0 Demonstrate a working knowledge of automatic brake systems operation.
29.0 Demonstrate a working knowledge of anti-lock brake system diagnosis and repair.
30.0 Demonstrate a working knowledge of electronic level control systems.
31.0 Demonstrate a working knowledge of electronic steering systems.
32.0 Demonstrate a working knowledge of electronically controlled charging systems.
33.0 Demonstrate a working knowledge of driveability lab.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Autotronics POSTSECONDARY NUMBER: I470614

01.0 DEMONSTRATE A WORKING KNOWLEDGE OF LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.
01.06 Identify components of computer system consisting of central processing unit, monitor, keyboard, data storage devices and peripherals.
01.07 Initialize computer and operate keyboard.

02.0 DEMONSTRATE A WORKING KNOWLEDGE OF DIRECT CURRENT CIRCUITS--The student will be able to:

02.01 Solve problems in electronic units utilizing metric prefixes.
02.02 Relate electricity to the nature of matter.
02.03 Identify sources of electricity.
02.04 Define voltage, current, resistance, power and energy.
02.05 Read and interpret color codes and symbols to identify electrical components and values.
02.06 Measure properties of a circuit using volt-ohm meter and digital volt-ohm meter meters and oscilloscopes.
02.07 Apply Ohm's law to series circuits.
02.08 Construct and verify operation of series circuits.
02.09 Analyze and troubleshoot series circuits.
02.10 Apply Ohm's law to parallel circuits.
02.11 Verify the operation of parallel circuits.
02.12 Analyze and troubleshoot parallel circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of combination circuits.
02.15 Troubleshoot combination circuits.
02.16 Describe magnetic properties of circuits and devices.
02.17 Determine the physical and electrical characteristics of capacitors and inductors.

03.0 DEMONSTRATE A WORKING KNOWLEDGE OF ALTERNATING CURRENT (AC) CIRCUITS -- The student will be able to:

03.01 Identify properties of an AC signal.
03.02 Identify AC sources.
03.03 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.04 Define the characteristics of AC capacitive circuits.
03.05 Define the characteristics of AC inductive circuits.
03.06 Define basic motor theory and operation.
03.07 Define basic generator theory and operation.

04.0 DEMONSTRATE A WORKING KNOWLEDGE OF DUAL TRACE OSCILLOSCOPES -- The student will be able to:

04.01 Demonstrate proper operation and use of dual trace oscilloscope.

05.0 DEMONSTRATE A WORKING KNOWLEDGE OF SEMI-CONDUCTOR DEVICES -- The student will be able to:

05.01 Overview of semi-conductor materials.
05.02 List types of diodes.
05.03 Explain application operation and characteristics of diodes.
05.04 explain construction,applications and use of silicon controlled rectifiers.
05.05 Describe transistor construction.
05.06 Explain characteristics of PNP/NPN transistors.
05.07 Measure current flow and calculate amplifier gain.
05.08 Explain construction and use of Darlington pair.
05.09 Explain concept of open collector operation.
05.10 Identify and define operating characteristics and applications of junction diodes.
05.11 Construct, analyze and troubleshoot diode circuits (basic breadboard).
05.12 Identify and define operating characteristics and applications of bipolar transistors.
05.13 Identify and define operating characteristics and applications of field effect transistors.
05.14 Identify and define operating characteristics and applications of single-stage amplifiers.
05.15 Construct, analyze and troubleshoot single-stage amplifiers.

06.0 DEMONSTRATE A WORKING KNOWLEDGE OF INTEGRATED CIRCUITS -- The student will be able to:

06.01 Identify and define operating characteristics and applications of linear integrated circuits.
06.02 Construct linear integrated circuits.
06.03 Analyze and troubleshoot linear integrated circuits.
06.04 Identify and define operating characteristics and applications of power supply regulator circuits.
06.05 Explain positive logic concepts.
06.06 Explain Schmidt trigger concept.
06.07 Explain invertor concepts.
06.08 Explain logic gates.
06.09 Explain quad driver and its use.
06.10 Analyze and troubleshoot power supply regulator circuits.
06.11 Identify and define operating characteristics and applications of opto-electronic devices.
06.12 Set up and operate measuring instruments for analog circuits and computer's diagnosis of auto system (emphasis volt meter).

07.0 DEMONSTRATE A WORKING KNOWLEDGE OF DIGITAL CIRCUITS -- The student will be able to:

07.01 Set up and operate logic probes for digital circuits.
07.02 Identify types of logic gates and their truth tables.
07.03 Construct combinational logic circuits using integrated circuits.
07.04 Analyze types of flip-flops and their truth tables.
07.05 Troubleshoot flip-flops.
07.06 Identify, define and measure characteristics of integrated circuit (IC) logic families.
07.07 Identify types of registers and counters.
07.08 Identify types of memory circuits.
07.09 Relate the uses of digital-to-analog and analog-to-digital conversions.
07.10 Troubleshoot digital-to-analog and analog-to digital circuits.
07.11 Identify types of digital displays.
07.12 Construct digital display circuits.

07.13 Troubleshoot digital display circuits.

08.0 DEMONSTRATE A WORKING KNOWLEDGE OF MICROPROCESSOR FUNDAMENTALS -- The student will be able to:

08.01 Explain fundamentals of microprocessor operation.
08.02 Analyze and measure properties of analog and digital signals utilizing VOM, DVM and oscilloscope.
08.03 Describe differences between analog and digital signals.
08.04 Explain type of memory(s).
08.05 Explain central processing unit operation.
08.06 Describe function of clock generator.
08.07 Explain function of analog to digital and digital to analog convertors (interface).
08.08 Explain binary code.
08.09 Explain pulse width modulation (duty cycle).
08.10 Explain sensor information processing.
08.11 Explain serial/parallel data processing.
08.12 Describe function of multiplexing.

09.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC ENGINE CONTROLS -- The student will be able to:

09.01 Describe stoichiometric air/fuel ratio.
09.02 Describe computer control of air fuel ratio using concept of open loop/closed loop.
09.03 Describe adaptive memory, integrator, block learn.
09.04 Describe effect of air/fuel ratio, timing and exhaust gas recirculating system operation.
09.05 Describe function of three-way catalyst.
09.06 Describe methods of controlling air/fuel ratio.

10.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC CONTROL MODULE INPUT AND OUTPUT DEVICES AND THEIR FUNCTIONS -- The student will be able to:

10.01 Demonstrate an understanding of the operation and use of dual trace oscilloscope.
10.02 Describe temperature sensor operation.
10.03 Describe manifold and barometric sensors operation.
10.04 Describe exhaust gas oxygen sensor operation.
10.05 Describe switch and timer circuit operation.
10.06 Explain construction and operation of Hall effect switch.
10.07 Perform testing of Hall effect switches.
10.08 Describe engine speed sensor operation.
10.09 Describe vehicle speed sensor(s) operation.
10.10 Describe throttle position sensor operation.
10.11 Perform testing of electronic timing controls including knock sensor.
10.12 Utilize oscilloscope to test pick-up coil, Hall-effect switch, EST circuits, reference circuits.
10.13 Describe detonation control (electronic spark control).
10.14 Demonstrate an understanding of electronic spark timing operation.
10.15 Describe mass airflow sensor operation.
10.16 Describe electronic control module control of fuel evaporative system.
10.17 Describe crankshaft position sensor operation.
10.18 Describe electronic control module control of air-management system.
10.19 Describe electronic control module control of early fuel evaporation (EFE).
10.20 Describe electronic control module control of spark timing.
10.21 Describe electronic control module control of carbureated fuel

mixture.
10.22 Describe type of fuel injection systems.
10.23 Describe components of throttle-body injection systems.
10.24 Describe components of port fuel injection systems.

11.0 DEMONSTRATE A WORKING KNOWLEDGE OF TROUBLESHOOTING ELECTRONIC CONTROL MODULE SYSTEMS -- The student will be able to:

11.01 Describe procedures for troubleshooting electronic control module systems.
11.02 Describe type and use of trouble code(s).
11.03 Demonstrate use of generic and manufacturers' test equipment.
11.04 Describe difference between hard failure/soft failure.
11.05 Perform trouble code retrieval procedures.
11.06 Perform pin-out check on electronic control module input and output devices.
11.07 Remove/replace electronic control module/calibration unit.
11.08 Demonstrate ability to troubleshoot electronic control module systems utilizing manufacturers' diagnostic charts.
11.09 Demonstrate general knowledge of electronic systems for major imports.

12.0 DEMONSTRATE A WORKING KNOWLEDGE OF SYSTEM OPERATION -- The student will be able to:

12.01 Explain the operation of computer shifted automatic transmission systems.
12.02 Explain viscous converter clutch.
12.03 Describe control module's effect on shifting patterns.
12.04 Explain the function and operation of engine load sensors.

13.0 DEMONSTRATE A WORKING KNOWLEDGE OF SYSTEM INPUT DEVICES -- The student will be able to:

13.01 Explain neutral safety/backup light switch.
13.02 Explain throttle position sensor (potentiometer).
13.03 Explain vehicle speed sensor.
13.04 Explain function of brake release switch.
13.05 Explain engine coolant temperature sensor.
13.06 Explain function of air conditioning pressure switches.
13.07 Explain cold inhibit switch.
13.08 Explain operation of vacuum switches.
13.09 Explain thermal vacuum valve.
13.10 Explain vacuum regulator valve.
13.11 Explain vehicle speed sensor tripper module.

14.0 DEMONSTRATE A WORKING KNOWLEDGE OF SYSTEM OUTPUT DEVICES -- The student will be able to:

14.01 Explain operation of valve body/solenoid valve.
14.02 Explain function of gear switches.
14.03 Explain torque converter clutch apply valve.
14.04 Explain torque converter clutch delay valve.
14.05 Explain engine coolant fan temperature switch.
14.06 Explain governor pressure control switch.
14.07 Explain function of pulse relay.

15.0 DEMONSTRATE A WORKING KNOWLEDGE OF SYSTEM DIAGNOSIS AND REPAIR -- The student will be able to:

15.01 Describe system check.
15.02 Diagnose and differentiate between mechanical and electrical

problems.
15.03 Diagnose shifting problems related to engine performance.
15.04 Identify driver habits effecting engine/transmission related diagnosis.
15.05 Describe stored code removal.

16.0 DEMONSTRATE A WORKING KNOWLEDGE OF COMPUTER OUTPUT DISPLAYS -- The student will be able to:

16.01 Describe, diagnose and repair service engine lights/emission lights.
16.02 Describe, diagnose and replace liquid crystal displays.
16.03 Describe, diagnose and replace vacuum tube fluorescent displays.
16.04 Describe, diagnose and repair/replace electronic speedometer system.
16.05 Describe, diagnose, and replace quartz-electric cluster.
16.06 Describe, diagnose and replace digital cluster.
16.07 Describe, diagnose and repair/replace odometer.

17.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC INSTRUMENTATION SYSTEMS -- The student will be able to:

17.01 Explain electronic instrumentation.
17.02 Diagnose and replace light emitting diode.

18.0 DEMONSTRATE A WORKING KNOWLEDGE OF THEFT DETERRENT SYSTEMS -- The student will be able to:

18.01 Describe theft deterrent system operation.
18.02 Diagnose and repair the theft deterrent system

19.0 DEMONSTRATE A WORKING KNOWLEDGE OF TRIP COMPUTER AND TRIP MONITOR SYSTEMS -- The student will be able to:

19.01 Describe trip computer and trip monitor operations.
19.02 Diagnose and repair trip computer and trip monitor.

20.0 DEMONSTRATE A WORKING KNOWLEDGE OF WINDSHIELD WIPER AND WASHER SYSTEMS -- The student will be able to:

20.01 Describe windshield wiper and washer system operation.
20.02 Diagnose and repair trip computer and trip monitor.

21.0 DEMONSTRATE A WORKING KNOWLEDGE OF CRUISE CONTROL SYSTEMS -- The student will be able to:

21.01 Describe cruise control operation.
21.02 Diagnose and repair cruise control system.

22.0 DEMONSTRATE A WORKING KNOWLEDGE OF VOICE ALERT SYSTEMS -- The student will be able to:

22.01 Describe voice alert system operation.
22.02 Diagnose and replace audio system components.
22.03 Perform on-car adjustment of audio system.

23.0 DEMONSTRATE A WORKING KNOWLEDGE OF AUDIO SYSTEMS -- The student will be able to:

23.01 Describe radio system operation.
23.02 Diagnose and replace audio system components.
23.03 Perform on-car adjustments of audio system.

24.0 DEMONSTRATE A WORKING KNOWLEDGE OF GUIDE-MATIC AND TWILIGHT SENTINEL SYSTEMS -- The student will be able to:

24.01 Describe the dimmer system operation.
24.02 Diagnose and repair guide-matic and twilight sentinel systems.
24.03 Perform on-car adjustment of guide-matic and twilight sentinel systems.

25.0 DEMONSTRATE A WORKING KNOWLEDGE OF CLIMATE CONTROL SYSTEMS -- The student will be able to:

25.01 Describe operation of climate control systems.
25.02 Diagnose and repair electronic system.
25.03 Perform on car adjustment of system

26.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC SEATS WITH MEMORY -- The student will be able to:

26.01 Describe operation of memory system.
26.02 Diagnose and repair electronic seats.
26.03 Perform on-car adjustment of system.

27.0 DEMONSTRATE A WORKING KNOWLEDGE OF FIBER OPTICS -- The student will be able to:

27.01 Theory of fiber optics.
27.02 Application of fiber optics.
27.03 Describe and identify fiber optic systems.
27.04 Diagnose and repair fiber optic systems.

28.0 DEMONSTRATE A WORKING KNOWLEDGE OF AUTOMATIC BRAKE SYSTEMS OPERATION -- The student will be able to:

28.01 Describe two-wheel and four-wheel anti-lock brake systems.
28.02 Identify anti-lock brake system components, electrical circuits and controls.
28.03 Explain brake modulation.
28.04 Explain built-in diagnosis on anti-lock brake system control module.
28.05 Explain use and location of skid control sensor.
28.06 Describe, diagnose and replace control module, if equipped.

29.0 DEMONSTRATE A WORKING KNOWLEDGE OF ANTI-LOCK BRAKE SYSTEM DIAGNOSIS AND REPAIR -- The student will be able to:

29.01 Perform basic diagnosis and testing using manufacturers' test equipment.
29.02 Diagnose problems with master cylinder, hydraulic booster, electric pump accumulator and valve body assembly.
29.03 Diagnose problems with fluid level warning switches.
29.04 Test electronic wheel sensors.
29.05 Perform system self diagnostic test.
29.06 Perform trouble code diagnostic procedures using manufacturers' diagnostic charts.
29.07 Perform pin-out checks.
29.08 Describe, diagnose and replace control module if equipped.

30.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC LEVEL CONTROL SYSTEMS--The student will be able to:

30.01 Describe operation of electronic leveling control system.
30.02 Demonstrate the correct vehicle raising and lowering operation.

30.03 Explain the air replenishment system.
30.04 Describe a height adjuster sensor.
30.05 Perform diagnostic procedures using manufacturers' diagnostic charts.
30.06 Perform electrical circuit diagnosis.
30.07 Test system for correct performance.
30.08 Test compressor operation.
30.09 Test height sensor operation.
30.10 Test compressor current draw.
30.11 Test residual pressure.
30.12 Test system for air leaks.
30.13 Describe, diagnose and replace control module if equipped.

31.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONIC STEERING SYSTEMS--The student will be able to:

31.01 System operation.
31.02 System diagnosis and repair.

32.0 DEMONSTRATE A WORKING KNOWLEDGE OF ELECTRONICALLY CONTROLLED CHARGING SYSTEM--The student will be able to:

32.01 System operation.
32.02 System diagnosis and repair.

33.0 DEMONSTRATE A WORKING KNOWLEDGE OF DRIVEABILITY LAB--The student will be able to:

33.01 Demonstrate a knowledge of current technology in electronic engine control systems.
33.02 Interpret vehicle identification numbers.
33.03 Perform comprehensive engine performance analysis using oscilloscope and other appropriate equipment.
33.04 Perform a diagnostic circuit check of on-board microprocessor systems (self-test).
33.05 Define and determine open and closed loop system operation.
33.06 Explain and service an air injection system.
33.07 Explain and service thermal systems.
33.08 Explain and service charcoal canister purge systems.
33.09 Service pollution control valve systems.
33.10 Service exhaust gas-type fuel evaporative systems.
33.11 Service electric type fuel evaporative systems.
33.12 Explain, diagnose and demonstrate the servicing of the service exhaust gas recirculating systems.
33.13 Test vacuum switch.
33.14 Test solenoid operated vacuum switch.
33.15 Service and repair engine cooling fan systems.
33.16 Perform non-scan tool tests on inputs and controls of microprocessor systems.
33.17 Perform scan tool diagnostics on inputs and controls of microprocessor systems.
33.18 Test, service and repair microprocessor input sensors and control devices.
33.19 Demonstrate the use of manufacturers' diagnostic charts.
33.20 Perform system performance checks on electronic engine control systems.
33.21 Diagnose cold driveability problems.
33.22 Diagnose warm driveability problems.
33.23 Perform sensor adjustment.
33.24 Perform exhaust gas backpressure test.
33.25 Check and reset ignition timing and idle speed settings as per vehicle emission control information label.

33.26 Perform internal and external adjustments on electronic carburetors.
33.27 Test and adjust minimum air flow.
33.28 Analyze exhaust gases for proper emissions.
33.29 Test electronic idle air control.
33.30 Check idle stop solenoid.
33.31 Repair circuits with the use of wiring diagrams and component locator manuals.
33.32 Perform field repairs to wiring and connectors.
33.33 Test and service electronic ignition systems.
33.34 Test and service anti-detonation (knock sensor) devices.
33.35 Perform pin out tests and interpret readings.
33.36 Check engine vacuum systems for proper routing and connections.
33.37 Service air inlet systems.
33.38 Test and/or replace ignition coils.
33.39 Demonstrate the procedure for electronic control module.
33.40 Perform diagnostic test on torque convertor clutch circuit and components.
33.41 Perform fuel pump pressure test on vehicles equipped with electronic fuel injection.
33.42 Test specific gravity of fuel, analyze and check for contaminants.
33.43 Perform fuel injector balance test on vehicles equipped with individual fuel injectors.
33.44 Perform fuel system diagnosis and performance checks.
33.45 Perform fuel pressure level tests.
33.46 Disassemble/reassemble throttle body unit.
33.47 Perform fuel injector cleaning procedures.
33.48 Test mass air flow sensor.
33.49 Remove, test, adjust and/or replace fuel injector.
33.50 Demonstrate understanding of system components.
33.51 Repair vehicles displaying various service codes as they would be encountered in a service situation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aviation Administration

CODE NUMBER: Secondary_______ Postsecondary_______

Florida CIP 0649.010400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS _x_ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

_x_Postsecondary Vocational ___Other _______________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as communication, transportation, utility management (15023015), air station managers (184.167-082) provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, technical writing, records management, security, Federal Aviation Administration regulations, data processing, and air cargo transportation.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the development and reinforcement of skills in human relations, facility management and air cargo and passenger management.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer

which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the

student will be able to:

01. Demonstrate understanding of safe and efficient work practices.
02. Demonstrate understanding of Federal Aviation Administration, state and other governmental laws, rules and policies.
03. Demonstrate understanding of personnel management.
04. Demonstrate understanding of business law and management pertaining to aeronautics.
05. Demonstrate understanding of aviation safety and accident prevention and investigation.
06. Prepare, analyze and evaluate technical reports and data.
07. Demonstrate understanding of federal and state security procedures.
08. Maintain personnel records and budgets.
09. Evaluate facility maintenance problems and prescribe corrective action.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: Aviation Administration — POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE AN UNDERSTANDING OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of ecological problems and know the solutions unique to the industry.
01.02 Demonstrate an awareness and understanding of fueling hazards.
01.03 Demonstrate an awareness and understanding of physical hazards.
01.04 Demonstrate an awareness and understanding of fire hazards.
01.05 Demonstrate an awareness of and the ability to control and extinguish fires.
01.06 Demonstrate an awareness and understanding of the need for safety devices, controls, guards and equipment.
01.07 Demonstrate awareness, understanding and use of personal safety devices such as goggles, masks, helmets, hearing protectors, air respirators and protective clothing.

02.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AVIATION ADMINISTRATION, STATE AND OTHER GOVERNMENTAL LAWS, RULES AND POLICIES--The student will be able to:

02.01 Describe the economic, social and political importance of commercial aviation, general aviation and aircraft manufacturing in the United States.
02.02 Describe the function, basic organization and responsibility of the National Transportation Safety Board.
02.03 Explain major portions of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.
02.04 List and describe the federal statutes pertaining to the economic regulation of the airline industry.
02.05 List and describe the major federal statutes pertaining to the regulation of aviation safety.
02.06 Describe the historical and current relationship between the U.S. Post Office and the aviation industry.
02.07 List and describe six categories of general aviation.
02.08 Describe the development of aviation laws and their analogy to the Law of the Sea.
02.09 Explain the Department of Transportation, State of Florida, and its structure as relates to the aircraft industry.

03.0 DEMONSTRATE UNDERSTANDING OF PERSONNEL MANAGEMENT--The student will be able to:

03.01 Name and describe the basic guides in personnel management.
03.02 Discuss governmental relations in personnel management.
03.03 Explain the general nature of personnel problem, and approaches to problem solving.
03.04 State the general nature of job and personnel requirements; and technical and managerial employee requirements.
03.05 Tell the importance and scope of education; and the role of communication and the fundamental rules of communication.
03.06 Discuss the significance of remuneration and its problems; both economic and non-economic.
03.07 Describe training and education aspects of company programs.
03.08 State the role and purpose of interviewing and counseling.

04.0 DEMONSTRATE UNDERSTANDING OF BUSINESS LAW AND MANAGEMENT PERTAINING TO AERONAUTICS--The student will be able to:

04.01 Describe and identify in what manner and under what conditions an aviation company may expose itself to a lawsuit.
04.02 Discuss the fundamental aspects of several categories of law that may affect the company because of its activities.
04.03 State the fundamental principles of torts, contracts, bailments, labor, agency, negligence, administrative, product liability, partnerships, and corporations.
04.04 Explain how an employee's action or inaction may subject the aviation company to a law suit involving one or more of the several categories of law.

05.0 DEMONSTRATE UNDERSTANDING OF AVIATION SAFETY AND ACCIDENT PREVENTION AND INVESTIGATION--The student will be able to:

05.01 Describe and explain the complete regulation that is still exercised by the Federal government in the field of safety, and investigation.
05.02 State and discuss the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, safety Regulations of Civil Aeronautics.
05.03 Tell the minimum standards governing design, materials workmanship, performance of aircraft, inspection, servicing, overhaul of aircraft, and parts and appliances, equipment and facilities, as required by Section 601 (a) of Federal Aviation Act of 1958 Section 601 (a).
05.04 Discuss the maximum hours of service for airmen and other employees, and other practices, methods, and procedures as required by Section 601 (a) of the Federal Aviation Act of 1958.
05.C5 Explain the Federal Aviation Regulations (FAR's) promulgated by the Administrator to implement the authority granted by the Federal Aviation Act of 1958, in the area of safety, and to prevent accidents.

06.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL REPORTS AND DATA--The student will be able to:

06.01 State the five basic guidelines for preparation of technical reports.
06.02 Compare the difference between technical and literary description.
06.03 Describe the techniques used in technical report writing.
06.04 Discuss the arrangement of the technical written report--such as cause and effect, inductive and deductive, enumeration and classification, problems and solution.
06.05 Explain the preparatory work or stages in the process such as the writing, the drafts, use of the library, and polish style.
06.06 Tell types of reports, and describe use of illustrations.
06.07 Discuss the steps in developing an oral presentation.

07.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AND STATE SECURITY PROCEDURES--The student will be able to:

07.01 Describe passenger security systems in use.
07.02 Describe and define federal security laws.
07.03 Identify local law enforcement agencies.
07.04 List known security risk features.
07.05 Describe cargo theft precautions in use at facility.
07.06 Describe the International Air Transport Association.
07.07 List the more common labels found in the "Restricted Articles Regulations" as published in bulletins by IATA.

08.0 MAINTAIN PERSONNEL RECORDS AND BUDGETS--The student will be able to:

08.01 State the scope of selection procedures.
08.02 Describe the nature of the information gathered about candidates.
08.03 Explain the process of interpreting the findings and making of decisions.
08.04 Tell the nature of the necessary reports and records of candidates rejected, and candidates accepted.
08.05 State the objectives of the personnel program as related to the overall objectives of the company, whether the company provides a service or a product.
08.06 Discuss the specific goals sought and tasks to be undertaken by the personnel department, such as the number of people to be hired, types of personnel, grievance or bargaining sessions, anticipated worker accidents or illnesses.
08.07 State the staff necessary to attain goals; and equipment and resources they will require.
08.08 Explain how the requirements to attain the stated company goals will necessitate the allocation of the stated budget in order to implement the requisite program.

09.0 EVALUATE FACILITY MAINTENANCE PROBLEMS AND PRESCRIBE CORRECTIVE ACTION--The student will be able to:

09.01 Describe and explain the complete regulation that is still exercised by the Federal government in the field of safety, and maintenance.
09.02 Tell the minimum standard for work practices including methods and procedures as required by Section 601 (a) of the Federal Aviation Act of 1958.
09.03 Explain the Federal Aviation Regulations (FAR's) promulgated by the Administrator to implement the authority granted by the Federal Aviation Act of 1958.
09.04 State the procedures and practices in conformity with the FAR's when FAA inspectors review the company practices.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aviation Maintenance Management

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0649.010401

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ___Other_______________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as aircraft mechanics (85323630), aircraft maintenance supervisors (621.131-014, or aviation maintenance managers. Graduates will be eligible for FAA certification as airframe and powerplant mechanics and will be trained to troubleshoot maintenance problems and supervise mechanics in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

The program content will adhere to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance powerplant and airframe technician certification as prescribed by FAR 147.

The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: practical hands-on experiences using the tools and equipment appropriate to the program content and in accordance with current practices in the industry. All the aforementioned activities are conducted in an organizational pattern conducive to good supervisory and management practices.

III. SPECIAL NOTE: The Professional Aviation Maintenance Association (PAMA) is the organization which reinforces classroom instruction by providing communications, leadership, human relations management and employability training experiences. It also reinforces specific professional skills. When provided, these activities are considered an important supplement to this program.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate in Science degree.

A student may elect to progress from airframe mechanic subjects or powerplant mechanic subjects without repeating the general mechanic skills. Upon completion of both the airframe and the powerplant competencies, the student will qualify as an airframe and powerplant mechanic.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic electricity skills.
02. Perform basic aircraft drawing skills.
03. Demonstrate aircraft weight and balance skills.
04. Maintain aircraft fluid lines and fittings.
05. Perform aircraft materials and process skills.
06. Perform ground operations and servicing duties.
07. Perform cleaning and corrosion control operations.
08. Demonstrate mathematics skills.
09. Maintain forms and records.
10. Apply basic physics to airframe and powerplant systems.
11. Demonstrate the use of maintenance publications.
12. Interpret mechanic privileges.
13. Perform basic reciprocating engine skills.
14. Perform basic turbine engine skills.
15. Perform engine inspection.
16. Maintain engine instrument systems.
17. Maintain engine fire protection systems.
18. Maintain engine electrical systems.
19. Maintain lubrication systems.
20. Maintain ignition systems.
21. Maintain fuel metering systems.
22. Maintain engine fuel systems.
23. Maintain injection systems.
24. Maintain engine cooling systems.
25. Maintain engine exhaust systems.
26. Maintain aircraft propellers.
27. Maintain wood structures.
28. Perform aircraft covering.
29. Apply aircraft finishes.
30. Repair sheetmetal structures.
31. Perform aircraft welding.
32. Perform airframe assembly and rigging.
33. Perform airframe inspection.
34. Maintain aircraft landing gear systems.
35. Maintain hydraulic and pneumatic power systems.
36. Maintain cabin atmosphere control systems.
37. Maintain aircraft instrument systems.
38. Maintain communication and navigation systems.
39. Inspect and repair aircraft fuel systems.
40. Inspect or repair aircraft electrical systems.
41. Inspect and repair position and warning systems.
42. Maintain ice and rain control systems.
43. Inspect and repair aircraft fire protection systems.
44. Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
45. Demonstrate the ability to communicate skillfully.
46. Demonstrate the human relations skills necessary for success in supervision.
47. Demonstrate a knowledge of skills and attitudes the supervisor needs for effective performance.

48. Demonstrate a practical approach to job management.
49. Demonstrate appropriate communication skills.
50. Demonstrate appropriate math skills.
51. Demonstrate appropriate understanding of basic science.
52. Demonstrate employability skills.
53. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: _________

PROGRAM TITLE: Aviation Maintenance Management POSTSECONDARY NUMBER: _____

01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:

01.01 Measure capacitance and inductance.
01.02 Calculate and measure electrical power.
01.03 Measure voltage, current, resistance, continuity, and leakage.
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.
01.05 Read and interpret electrical circuit diagrams.
01.06 Inspect and service batteries.
01.07 Utilize proper electrical safety procedures.

02.0 PERFORM BASIC AIRCRAFT DRAWING SKILLS--The student will be able to:

02.01 Use drawings, symbols, and schematic diagrams.
02.02 Draw sketches of repairs and alterations.
02.03 Use blueprint information.
02.04 Use graphs and charts.

03.0 DEMONSTRATE AIRCRAFT WEIGHT AND BALANCE SKILLS--The student will be able to:

03.01 Weigh aircraft.
03.02 Perform complete weight and balance check and record data.
03.03 Utilize proper personal safety procedures.

04.0 MAINTAIN AIRCRAFT FLUID LINES AND FITTINGS--The student will be able to:

04.01 Fabricate and install rigid and flexible fluid lines and fittings.
04.02 Identify and utilize special fluid line tools.

05.0 PERFORM AIRCRAFT MATERIALS AND PROCESSES SKILLS--The student will be able to:

05.01 Identify and select appropriate hand and power tools.
05.02 Identify and select appropriate nondestructive testing methods.
05.03 Perform penetrant, chemical etching, and magnetic particle inspections.
05.04 Perform basic heat-treating processes.
05.05 Identify and select aircraft hardware.
05.06 Inspect and check welds.
05.07 Perform precision measurements.
05.08 Perform safety wiring techniques.

06.0 PERFORM GROUND OPERATIONS AND SERVICING DUTIES--The student will be able to:

06.01 Start, ground operate, move, service, and secure aircraft.
06.02 Identify and select fuels.
06.03 Comply with prescribed shop and personal safety procedures.

07.0 PERFORM CLEANING AND CORROSION CONTROL OPERATIONS--The student will be able to:

07.01 Identify and select cleaning materials.

07.02 Perform aircraft cleaning and corrosion control.
07.03 Identify and utilize appropriate equipment for cleaning and corrosion control.
07.04 Observe appropriate personal safety procedures for corrosive chemicals.

08.0 DEMONSTRATE MATHEMATICAL SKILLS--The student will be able to:

08.01 Work with the common sets of real numbers in performing the four basic operations.
08.02 Use the four basic operations in working with polynomial expressions.
08.03 Solve linear equations in one variable and applied problems.
08.04 Solve linear inequalities in one variable and applied problems.
08.05 Factor polynomials.
08.06 Simplify algebraic fractions, complex fractions and solve rational and literal equations and applied problems.
08.07 Extract roots and raise numbers to a given power.
08.08 Determine areas and volumes of various geometrical shapes.
08.09 Solve ratio, proportion, and percentage problem.
08.10 Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.
08.11 Graph linear equations and inequalities in two variables and solve graph systems of linear equations and inequalities in two variables.
08.12 Solve and graph quadratic equations and inequalities with real solutions and solve related word problems.

09.0 MAINTAIN FORMS AND RECORDS--The student will be able to:

09.01 Write descriptions of aircraft condition and work performed.
09.02 Complete required maintenance forms, records, and inspection reports.

10.0 APPLY BASIC PHYSICS TO AIRFRAME AND POWERPLANT SYSTEMS--The student will be able to:

10.01 Use the principles of simple machines; sound, fluid, and heat dynamics.
10.02 Explain the effect of air density on engine power output and airfoil lift.

11.0 DEMONSTRATE THE USE OF MAINTENANCE PUBLICATIONS--The student will be able to:

11.01 Select and use FAA and manufacturer's aircraft maintenance specifications and related regulations.
11.02 Read technical data.
11.03 Retrieve data from maintenance data banks.

12.0 INTERPRET MECHANIC PRIVILEGES--The student will be able to:

12.01 Exercise mechanic privileges within the limitations prescribed by FAR Part 65.
12.02 Comply with prescribed shop and personal safety procedures.

13.0 PERFORM BASIC RECIPROCATING ENGINE SKILLS--The student will be able to:

13.01 Inspect and repair 14-cylinder or larger radial engine.
13.02 Overhaul reciprocating engine.
13.03 Inspect, check, service, and repair opposed and radial engines and reciprocating engine installations.

13.04 Install, troubleshoot, and remove reciprocating engines.

14.0 PERFORM BASIC TURBINE ENGINE SKILLS--The student will be able to:

14.01 Overhaul turbine engine.
14.02 Inspect, check, service, and repair turbine engines and turbine engine installations.
14.03 Install, troubleshoot, and remove turbine engines.

15.0 PERFORM ENGINE INSPECTION--The student will be able to:

15.01 Perform powerplant conformity and air worthiness inspections.
15.02 Perform appropriate safety wiring checks.

16.0 MAINTAIN ENGINE INSTRUMENT SYSTEMS--The student will be able to:

16.01 Troubleshoot, service, and repair fluid rate-of-flow indicating systems.
16.02 Inspect, check, service, troubleshoot, and repair engine temperature, pressure, and rpm indicating systems.

17.0 MAINTAIN ENGINE FIRE PROTECTION SYSTEMS--The student will be able to:

17.01 Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
17.02 Perform appropriate safety wiring check and repairs.

18.0 MAINTAIN ENGINE ELECTRICAL SYSTEMS--The student will be able to:

18.01 Repair engine electrical system components.
18.02 Install, check and service engine electrical wiring, controls, switches, indicators, and protective devices.
18.03 Identify and utilize special electrical tools and equipment.

19.0 MAINTAIN LUBRICATION SYSTEMS--The student will be able to:

19.01 Identify and select lubricants.
19.02 Repair engine lubrication system components.
19.03 Inspect, check, service, troubleshoot, and repair engine lubrication system.

20.0 MAINTAIN IGNITION SYSTEMS--The student will be able to:

20.01 Overhaul magneto and ignition harness.
20.02 Repair engine ignition system components.
20.03 Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine ignition systems.

21.0 MAINTAIN FUEL METERING SYSTEMS--The student will be able to:

21.01 Inspect, check, and service water injection systems.
21.02 Overhaul carburetor.
21.03 Repair engine fuel metering system components.
21.04 Inspect, check, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.
21.05 Perform safety wiring techniques.

22.0 MAINTAIN ENGINE FUEL SYSTEMS--The student will be able to:

22.01 Repair engine fuel system components.
22.02 Inspect, check, service, troubleshoot, and repair engine fuel systems.

22.03 Inspect, check, service, and repair carburetor air intake and induction manifolds.

24.0 MAINTAIN ENGINE COOLING SYSTEMS--The student will be able to:

24.01 Repair engine cooling system components.
24.02 Inspect, check, troubleshoot, service and repair engine cooling systems.

25.0 MAINTAIN ENGINE EXHAUST SYSTEMS--The student will be able to:

25.01 Repair engine exhaust system components.
25.02 Inspect, check, troubleshoot, service and repair engine exhaust systems.

26.0 MAINTAIN AIRCRAFT PROPELLERS--The student will be able to:

26.01 Inspect, check, service and repair propeller synchronizing and ice control systems.
26.02 Identify and select propeller lubricants.
26.03 Balance propellers.
26.04 Repair propeller control system components.
26.05 Inspect and repair fixed-pitch, constant speed and feathering propellers and governing systems.
26.06 Install, troubleshoot and remove propellers.

27.0 MAINTAIN WOOD STRUCTURES--The student will be able to:

27.01 Service and repair wood structures.
27.02 Identify wood defects.
27.03 Inspect wood structures.

28.0 PERFORM AIRCRAFT COVERING--The student will be able to:

28.01 Select and apply fabric and fiberglass covering materials.
28.02 Inspect, test and repair fabric and fiberglass.

29.0 APPLY AIRCRAFT FINISHES--The student will be able to:

29.01 Apply trim, letters and touch-up paint.
29.02 Identify and select aircraft finishing materials.
29.03 Apply paint and dope.
29.04 Inspect finishes and identify defects.
29.05 Adhere to all safety practices dealing with flammable materials.

30.0 REPAIR SHEET METAL STRUCTURES--The student will be able to:

30.01 Identify and utilize appropriate metalworking tools and equipment.
30.02 Install special rivets and fasteners.
30.03 Inspect bonded structures.
30.04 Inspect and repair plastics, honeycomb and laminated structures.
30.05 Inspect check, service and repair windows, doors and interior furnishings.
30.06 Inspect and repair sheet-metal structures.
30.07 Install conventional rivets.
30.08 Hand form, lay out and bend sheet metal.

31.0 PERFORM AIRCRAFT WELDING--The student will be able to:

31.01 Identify and utilize appropriate welding equipment and material.
31.02 Solder stainless steel.

31.03 Fabricate tubular structures.
31.04 Solder, braze, gas-weld and arc-weld steel.
31.05 Weld aluminum and stainless steel.
31.06 Weld magnesium and titanium.

32.0 PERFORM AIRFRAME ASSEMBLY AND RIGGING--The student will be able to:

32.01 Identify and utilize appropriate rigging tools and equipment.
32.02 Rig rotary-wing aircraft.
32.03 Rig fixed-wing aircraft.
32.04 Check alignment of structures.
32.05 Assemble aircraft.
32.06 Balance and rig movable structures.
32.07 Jack aircraft.

33.0 PERFORM AIRFRAME INSPECTION--The student will be able to:

33.01 Perform conformity and airworthiness inspections.
33.02 Properly complete compliance forms and records.

34.0 MAINTAIN AIRCRAFT LANDING GEAR SYSTEMS--The student will be able to:

34.01 Inspect, check, service and repair landing gear retraction systems.
34.02 Inspect, check, service and repair shock struts, brakes, wheels, tires and steering systems.

35.0 MAINTAIN HYDRAULIC AND PNEUMATIC POWER SYSTEMS--The student will be able to:

35.01 Repair hydraulic and pneumatic power system components.
35.02 Identify and repair hydraulic fluids.
35.03 Inspect and repair hydraulic and pneumatic power systems.
35.04 Identify and utilize appropriate hydraulic and pneumatic tools and equipment.

36.0 MAINTAIN CABIN ATMOSPHERE CONTROL SYSTEMS--The student will be able to:

36.01 Repair air conditioning, pressurization and oxygen system components.
36.02 Inspect and repair heating, air conditioning and pressurization systems.
36.03 Inspect, check, troubleshoot, service and repair oxygen systems.

37.0 MAINTAIN AIRCRAFT INSTRUMENT SYSTEMS--The student will be able to:

37.01 Remove and install electrical, mechanical and pneumatic instruments.
37.02 Inspect and repair heading, speed, altitude, attitude and position systems.

38.0 MAINTAIN COMMUNICATION AND NAVIGATION SYSTEMS--The student will be able to:

38.01 Inspect, check and service auto-pilot and approach control systems.
38.02 Inspect, check and service electronic communication and navigation systems.
38.03 Inspect and repair antenna and electronic equipment installations.
38.04 Identify and utilize special electronic tools and equipment.

39.0 INSPECT AND REPAIR AIRCRAFT FUEL SYSTEMS--The student will be able to:

39.01 Check and service fuel dump systems.
39.02 Perform fuel management, transfer and defueling.
39.03 Inspect, check and repair pressure fuel systems.
39.04 Repair aircraft fuel system components.
39.05 Inspect and repair fluid quantity indicating systems.
39.06 Troubleshoot, service and repair fluid and temperature warning systems.
39.07 Inspect, check, service, troubleshoot and repair aircraft fuel systems.

40.0 INSPECT AND REPAIR AIRCRAFT ELECTRICAL SYSTEMS--The student will be able to:

40.01 Identify and utilize appropriate electrical tools and equipment.
40.02 Repair aircraft electrical system components.
40.03 Remove, service and install electric indicators, protective devices, wiring and controls.
40.04 Inspect and repair AC and DC current electrical systems.

41.0 INSPECT AND REPAIR POSITION AND WARNING SYSTEMS--The student will be able to:

41.01 Inspect, check and service speed - takeoff-warning systems, electrical brake controls and antiskid systems.
41.02 Inspect and repair landing gear and position indicating warning systems.

42.0 MAINTAIN ICE AND RAIN CONTROL SYSTEMS--The student will be able to:

42.01 Inspect, service and repair airframe ice and rain control systems.
42.02 Demonstrate operation of airframe ice and rain control systems.

43.0 INSPECT AND REPAIR AIRCRAFT FIRE PROTECTION SYSTEMS--The student will be able to:

43.01 Inspect, check and service smoke and carbon monoxide detection systems.
43.02 Inspect and repair fire detection and fire extinguishing systems.

44.0 DEMONSTRATE KNOWLEDGE OF FAA AIRCRAFT MECHANIC LICENSING REQUIREMENTS--The student will be able to:

44.01 Successfully complete the FAA powerplant written, oral and practical examinations.
44.02 Display an FAA powerplant Mechanic's certificate.
44.03 Successfully complete the FAA airframe written, oral and practical examinations.
44.04 Display an FAA airframe mechanic's certificate.

45.0 DEMONSTRATE THE ABILITY TO COMMUNICATE SKILLFULLY--The student will be able to:

45.01 Describe the importance of clear and concise writing.
45.02 Demonstrate proficiency in the effective use of speech and vocabulary.
45.03 Explain the importance of good listening skills.
45.04 Discuss the role communication plays in management.
45.05 Demonstrate the components of the communication process.
45.06 Demonstrate effective written communication skills.
45.07 Demonstrate effective oral communication skills.
45.08 Write technical reports.

46.0 DEMONSTRATE THE HUMAN RELATIONS SKILLS NECESSARY FOR SUCCESS IN SUPERVISION--The student will be able to:

46.01 Exhibit the ability to get along with others.
46.02 Discuss the importance of human relations.
46.03 Develop and demonstrate the unique human relations skills needed for successful entry and progress in supervising others.

47.0 DEMONSTRATE KNOWLEDGE OF SKILLS AND ATTITUDES THE SUPERVISOR NEEDS FOR EFFECTIVE PERFORMANCE--The student will be able to:

47.01 Describe leadership theory and its complexity.
47.02 Discuss how a new supervisor is introduced to leadership responsibilities.
47.03 Identify the legal and social environment for supervision.
47.04 Discuss pertinent legislation and the role of government intervention.
47.05 Describe problems in union and non-union organizations.

48.0 DEMONSTRATE A PRACTICAL APPROACH TO JOB MANAGEMENT--The student will be able to:

48.01 Assume responsibility in planning and coordinating resources.
48.02 Demonstrate effective decision making and problem solving techniques.
48.03 Implement methods of work improvement.

49.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

49.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
49.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
49.03 Read and follow written and oral instructions.
49.04 Answer and ask questions coherently and concisely.
49.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
49.06 Demonstrate appropriate telephone/communication skills.

50.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

50.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
50.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
50.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
50.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
50.05 Demonstrate an understanding of federal, state and local taxes and their computation.

51.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

51.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
51.02 Draw conclusions or make inferences from data:
51.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the

proper precautions required for handling such materials.

51.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

52.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

52.01 Conduct a job search.
52.02 Secure information about a job.
52.03 Identify documents which may be required when applying for a job interview.
52.04 Complete a job application form correctly.
52.05 Demonstrate competence in job interview techniques.
52.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
52.07 Identify acceptable work habits.
52.08 Demonstrate knowledge of how to make appropriate job changes.
52.09 Demonstrate acceptable employee health and grooming habits.
52.10 Exhibit punctuality, initiative, courtesy, loyalty and honesty.
52.11 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

53.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

53.01 Define entrepreneurship.
53.02 Describe the importance of entrepreneurship to the American economy.
53.03 List the advantages and disadvantages of business ownership.
53.04 Identify the risks involved in ownership of a business.
53.05 Identify the necessary personal characteristics of a successful entrepreneur.
53.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Aviation Quality Control

CODE NUMBER: Secondary _______ Postsecondary I489999

Florida CIP 0615.070201

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

_____Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: TEC MECH @ 7 G AIR MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as precision inspectors, testers and graders (83002713), or to provide supplemental training for persons previously or currently employed in these occupations.

In the first year, Dimensional Metrology, the purpose is to help the learner develop skills in the use of close tolerances measurements; to develop attitudes of patience, persistence and cleanliness in the use of all types of measuring equipment. In the second year, Nondestructive Testing, the purpose is to have the learner develop the knowledge and ability to correctly and safely use penetrant materials, magnetic particle materials and equipment, radiographic materials and equipment, and ultrasonic and eddy current equipment to industry levels of competence as outlined in ASNT-TC-1A.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, the use of blueprints and diagrams, engineering specifications, nondestructive reliability testing, material characteristics, component inspection and evaluation, electro-mechanics, electronic test equipment, assembly and repair of mechanical components, and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a classroom/laboratory setting using lecture, discussion, audio-visual presentations and demonstration. Hands-on experiences are a major portion of the available time, utilizing the instruments and equipment appropriate to the program content and in accordance with current procedures in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Explain different systems of measurement.
02. Measure with graduated scales.
03. Demonstrate proficiency with scaled instruments.
04. Demonstrate proficiency with vernier instruments.
05. Demonstrate techniques of using the surface plate.
06. Demonstrate proficiency in the use of micrometers.
07. Demonstrate the use of gauge blades.
08. Demonstrate proper utilization of dial indicators.
09. Calibrate different types of measuring instruments.
10. Demonstrate use of optical flats as measurement instruments.
11. Demonstrate use of various high amplification instruments.
12. Demonstrate different techniques in determining angle measurements.
13. Explain processing of metal from ore and inherent discontinuities.
14. Demonstrate visual inspection with various equipment.
15. Demonstrate techniques in the use of liquid penetrants.
16. Demonstrate methods of hardness testing.
17. Demonstrate methods of magnetic particle inspection.
18. Demonstrate techniques of radiographic inspection.
19. Demonstrate techniques of ultrasonic inspection.
20. Demonstrate techniques of eddy current inspection.
21. Demonstrate appropriate communication skills.
22. Demonstrate appropriate math skills.
23. Demonstrate appropriate understanding of basic science.
24. Demonstrate employability skills.
25. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: Aviation Quality Control — POSTSECONDARY NUMBER: I489999

01.0 EXPLAIN DIFFERENT SYSTEMS OF MEASUREMENT--The student will be able to:

01.01 Compare the new systems of measurement with the old.
01.02 Differentiate between the fractional and the decimal inch.
01.03 Explain the metric system of measurement.
01.04 Demonstrate how to round up and round down numbers.

02.0 MEASURE WITH GRADUATED SCALES--The student will be able to:

02.01 Read the steel scale.
02.02 Explain discrimination.
02.03 Demonstrate points of reference.
02.04 Demonstrate two kinds of error encountered in reading scales.

03.0 DEMONSTRATE PROFICIENCY WITH SCALED INSTRUMENTS--The student will be able to:

03.01 Use and read the depth gauge.
03.02 Demonstrate the uses of the combination square.
03.03 Demonstrate proper gauging pressure.
03.04 Set up and use surface gauges.

04.0 DEMONSTRATE PROFICIENCY WITH VERNIER INSTRUMENTS--The student will be able to:

04.01 Read a Vernier scale.
04.02 Demonstrate and compare two methods of measurement.
04.03 Set up and demonstrate the techniques of using the Vernier caliper, Vernier depth gauge, and Vernier height gauge.

05.0 DEMONSTRATE TECHNIQUES OF USING THE SURFACE PLATE--The student will be able to:

05.01 Give the definition of a reference plane.
05.02 Identify the different types of surface plates.
05.03 Explain what true flatness is.
05.04 Demonstrate proper safety in handling surface plates and their accessories.

06.0 DEMONSTRATE PROFICIENCY IN THE USE OF MICROMETERS--The student will be able to:

06.01 Recite the principles of measuring with the micrometer.
06.02 Read the micrometer scales.
06.03 Demonstrate the techniques of using the micrometer.
06.04 Adjust and calibrate the micrometer.
06.05 Demonstrate how to care for the micrometer.
06.06 Identify the different types of micrometers.
06.07 Demonstrate the use of telescoping and small hole gauges.

07.0 DEMONSTRATE THE USE OF GAUGE BLADES--The student will be able to:

07.01 Explain the history of gauge blocks and the evolution of standards.
07.02 Demonstrate the techniques of using gauge blocks.

07.03 Perform the operation of combining gauge blocks and using gauge block holders.
07.04 Show proper care in handling gauge blocks.

08.0 DEMONSTRATE PROPER UTILIZATION OF DIAL INDICATORS--The student will be able to:

08.01 Explain what measurement by comparison is.
08.02 Name and demonstrate different methods of amplification.
08.03 Explain the terms sensitivity, resolution and tolerance.
08.04 Demonstrate knowledge of the selection and use of dial indicators and their accessories.
08.05 Show how to calibrate and care for dial indicators.

09.0 CALIBRATE DIFFERENT TYPES OF MEASURING INSTRUMENTS--The student will be able to:

09.01 Show by demonstration different types of measurement errors.
09.02 Explain interaction of errors.
09.03 Calibrate micrometers, Vernier calipers, and dial indicators.

10.0 DEMONSTRATE USE OF OPTICAL FLATS AS MEASURING INSTRUMENTS--The student will be able to:

10.01 Explain the theory of light waves.
10.02 Identify the equipment used to measure light waves.
10.03 Demonstrate the techniques of setting up the equipment for measuring light waves.
10.04 Read and interpret the results of light wave measurement.
10.05 Demonstrate the application of optical flats for measurement.
10.06 Use proper care in handling optical flats.

11.0 DEMONSTRATE THE USE OF VARIOUS HIGH AMPLIFICATION INSTRUMENTS--The student will be able to:

11.01 Demonstrate the use of electronic mechanical, and optical comparators.
11.02 Explain the ten to one rule.
11.03 Demonstrate a case where temperature affects measurement.
11.04 Perform calibration and adjustments of high amplification instruments and show proper care in handling.

12.0 DEMONSTRATE DIFFERENT TECHNIQUES IN DETERMINING ANGLE MEASUREMENTS--The student will be able to:

12.01 Explain geometric angles and name the parts of a circle.
12.02 Demonstrate the techniques of using precision squares.
12.03 Read and use a bubble lever.
12.04 Operate the bevel protractor.
12.05 Set up and use the sine bar.

13.0 EXPLAIN PROCESSING OF METAL FROM ORE AND INHERENT DISCONTINUITIES--The student will be able to:

13.01 List and define the defects that are inherent in material.
13.02 List and define the defects resulting from processing material.
13.03 List and define the defects occurring in materials in service.

14.0 DEMONSTRATE VISUAL INSPECTION WITH VARIOUS EQUIPMENT--The student will be able to:

14.01 Show the ability to handle high power magnifying glasses.

14.02 Demonstrate the use of microscopes and borescopes.

15.0 DEMONSTRATE TECHNIQUES IN THE USE OF LIQUID PENETRANTS--The student will be able to:
15.01 Explain the theory of liquid penetrant testing.
15.02 Prepare parts and specimens for applying penetrant.
15.03 Demonstrate techniques for applying penetrant.
15.04 Demonstrate techniques of applying developer.
15.05 Interpret indications.
15.06 Explain the advantages and limitations of liquid penetrant testing.
15.07 Discuss safety and work precautions.

16.0 DEMONSTRATE METHODS OF HARDNESS TESTING--The student will be able to:

16.01 Explain the purpose of hardness testing.
16.02 Demonstrate the use of the conductivity tester.
16.03 List and define the mechanical methods of hardness testing.
16.04 Demonstrate the use of the Rockwell Hardness Tester.

17.0 DEMONSTRATE METHODS OF MAGNETIC PARTICLE INSPECTION--The student will be able to:

17.01 Explain the theory of magnetism.
17.02 Define the principles of magnetic particle testing.
17.03 Discuss the equipment used in magnetic particle testing.
17.04 Prepare specimens for testing.
17.05 Demonstrate the techniques of operating magnetic particle testing equipment.
17.06 List the types of particles and techniques of applying these particles.
17.07 Diagnose indications.
17.08 Demonstrate methods of demagnetizing parts.
17.09 Explain and discuss the advantages and limitations of magnetic particle testing.
17.10 Discuss safety and work precautions.

18.0 DEMONSTRATE TECHNIQUES OF RADIOGRAPHIC INSPECTION--The student will be able to:

18.01 Explain the theory and principles of radiography.
18.02 Operate the equipment used in radiographic testing.
18.03 Compare types of film used.
18.04 Prepare a specimen for X-ray.
18.05 Properly expose X-ray film.
18.06 Diagnose the image on the X-ray film.
18.07 Discuss the advantages and limitations of radiographic testing.
18.08 Explain the hazards involved in X-ray work.

19.0 DEMONSTRATE TECHNIQUES OF ULTRASONIC INSPECTION--The student will be able to:

19.01 Explain the theory of sound and sound wave propagation and generation.
19.02 Describe various equipment used in ultrasonic testing.
19.03 Demonstrate the techniques of operating ultrasonic equipment.
19.04 Prepare a specimen for testing.
19.05 Compare different methods of presentation.
19.06 Perform calibration checks using standard reference blocks.
19.07 Interpret indications on the cathode ray tube (A-scan).
19.08 Discuss the advantages and limitations of ultrasonic testing.
19.09 Explain the safety and work precautions in handling ultrasonic

equipment.

20.0 DEMONSTRATE THE TECHNIQUES OF EDDY CURRENT INSPECTION--The student will be able to:

20.01 Explain the principles of eddy current testing.
20.02 Read the different types of indicators.
20.03 Define the different types of test coils.
20.04 Prepare a specimen for testing.
20.05 Demonstrate the use of standards for analyzing results.
20.06 Operate eddy current equipment demonstrating proper techniques.
20.07 Interpret indications.
20.08 Discuss the advantages and limitations of eddy current testing.
20.09 Explain the work precautions and safety in handling the equipment.

21.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

21.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
21.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
21.03 Read and follow written and oral instructions.
21.04 Answer and ask questions coherently and concisely.
21.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
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22.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
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22.05 Demonstrate an understanding of federal, state and local taxes and their computation.

23.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

23.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
23.02 Draw conclusions or make inferences from data.
23.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
23.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

24.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

24.01 Conduct a job search.
24.02 Secure information about a job.
24.03 Identify documents which may be required when applying for a job interview.
24.04 Complete a job application form correctly.
24.05 Demonstrate competence in job interview techniques.

24.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
24.07 Identify acceptable work habits.
24.08 Demonstrate knowledge of how to make appropriate job changes.
24.09 Demonstrate acceptable employee health habits.
24.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida statutes Chapter 442.

25.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

25.01 Define entrepreneurship.
25.02 Describe the importance of entrepreneurship to the American economy.
25.03 List the advantages and disadvantages of business ownership.
25.04 Identify the risks involved in ownership of a business.
25.05 Identify the necessary personal characteristics of a successful entrepreneur.
25.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Avionics

CODE NUMBER: Secondary ________ Postsecondary I470199

Florida CIP 0647.019901

SECONDARY SCHOOL CREDITS____ COLLEGE CREDITS______ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 _x_ Postsecondary Adult Vocational

___ Postsecondary Vocational _x_ Other 30, 31

CERTIFICATION COVERAGE: AVIONICS @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as radio mechanics (85514600) and as avionics technicians 823.281-010. This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to, troubleshooting, repair and installation of airborne radio communications, radio navigations and radar equipment systems in accordance with regulatory and industry standards. Also included is instruction in basics of AM and FM transmitters and receivers and avionics equipment. Skills preparation for passing licensing/certification tests required by industry forms an integral part of the curriculum.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 10.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800-2000 hours when content from the Florida common core electronics program (Electronics Technology) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in AM and FM transmitters.
02. Demonstrate proficiency in AM and FM receivers.
03. Demonstrate proficiency in AM and FM transceivers.
04. Demonstrate proficiency in electromagnetic wave emissions.
05. Demonstrate proficiency in avionics radio repair station regulations and procedures.
06. Demonstrate proficiency in aircraft electrical systems and ground safety.
07. Demonstrate proficiency in line and bench maintenance of airborne communication systems.
08. Demonstrate proficiency in line and bench maintenance of airborne radio navigation systems and equipment.
09. Demonstrate proficiency in line and bench maintenance of airborne radar systems.
10. Demonstrate proficiency in the principles of operation of area navigation (R-NAV) systems.
11. Demonstrate proficiency in installing avionics systems.
12. Demonstrate proficiency in the calibration of test equipment.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER:
PROGRAM TITLE: Avionics
POSTSECONDARY NUMBER: I470199

01.0 DEMONSTRATE PROFICIENCY IN AM AND FM TRANSMITTERS--The student will be able to:

01.01 Define DSB, SSB and FM modulation.
01.02 Draw, analyze, and troubleshoot AM and FM RF oscillator circuits.
01.03 Draw, analyze, and troubleshoot buffer and multiplier circuits.
01.04 Draw, analyze, and troubleshoot RF power amplifier circuits.
01.05 Draw, analyze, and troubleshoot AM and FM modulation circuits.
01.06 Draw, analyze, and troubleshoot microphone circuits.
01.07 Draw, analyze, and troubleshoot balanced modulators and SSB filter circuits.
01.08 Draw, analyze and troubleshoot AM and FM power supply circuits.
01.09 Make power, frequency, and modulation measurements of AM and FM transmitters.
01.10 Align and troubleshoot AM and FM transmitters.
01.11 Describe FCC rules pertaining to AM and FM transmitter maintenance and operation.

02.0 DEMONSTRATE PROFICIENCY IN AM AND FM RECEIVERS--The student will be able to:

02.01 Draw, analyze, and troubleshoot receiver audio voltage and power amplifiers and speaker/headphone circuits.
02.02 Draw, analyze, and troubleshoot AM and FM detector circuits.
02.03 Draw, analyze, and troubleshoot AM IF amplifier circuits.
02.04 Draw, analyze, and troubleshoot FM IF amplifier and limited circuits.
02.05 Draw, analyze, and troubleshoot receiver oscillator and AFC circuits.
02.06 Draw, analyze, and troubleshoot RF mixer/hetrodyne circuits.
02.07 Draw, analyze, and troubleshoot receiver RF amplifier circuits.
02.08 Draw, analyze, and troubleshoot AVC/AGC circuits.
02.09 Draw, analyze, and troubleshoot receiver power supplies.
02.10 Make receiver sensitivity, selectivity, bandwidth, image rejection, and adjacent channel rejection measurements.
02.11 Align and troubleshoot AM and FM receivers.

03.0 DEMONSTRATE PROFICIENCY IN AM AND FM TRANSCEIVERS--The student will be able to:

03.01 Analyze and troubleshoot transceiver control, metering, and switching circuits.
03.02 Analyze and troubleshoot transceiver frequency synthesizers and phase locked loop circuits.
03.03 Analyze and troubleshoot squelch circuits.
03.04 Align and troubleshoot transceivers.

04.0 DEMONSTRATE PROFICIENCY IN ELECTROMAGNETIC WAVE EMISSIONS--The student will be able to:

04.01 Define the radio frequency spectrum.
04.02 Define types and classification of RF emissions.
04.03 Define the characteristics of radio waves.
04.04 Define radio wave propagation method.
04.05 Define the basic types of antennas.
04.06 Draw the voltage and current relationships and radiation patterns

for the basic types of antennas.
04.07 Solve signal strength problems and measure signal strength.
04.08 Solve problems pertaining to antenna length, propagation velocity, and frequency.
04.09 Define methods for antenna tuning, gain, and directivity.
04.10 Define transmission lines in terms of electrical and physical properties.
04.11 Define standing waves, cause and effect, and measure standing wave ratios.
04.12 Define tuned transmission lines and describe applications.

04.13 Draw voltage, current, and impedance relationships for tuned transmission lines.
04.14 Compute transmission line losses.
04.15 Construct transmission lines.
04.16 Define waveguides, resonant cavities and their applications.

05.0 DEMONSTRATE PROFICIENCY IN AVIONICS RADIO REPAIR STATION REGULATIONS AND PROCEDURES--The student will be able to:

05.01 Define repair station related regulatory and standardization agencies and their purposes.
05.02 Define repair station certification requirements.
05.03 Define requirements for certification of radio repairmen.
05.04 Practice proper station operation procedures.
05.05 Prepare repair station reports and documentation.

06.0 DEMONSTRATE PROFICIENCY IN AIRCRAFT ELECTRICAL SYSTEMS AND GROUND SAFETY--The student will be able to:

06.01 Define standard aircraft bus voltage.
06.02 Analyze aircraft electrical power generation and charging systems.
06.03 Analyze aircraft electrical power control and distribution systems.
06.04 Analyze aircraft electrical warning systems.
06.05 Analyze aircraft ignition systems.
06.06 Describe and practice aircraft ground handling safety procedures pertaining to avionics maintenance.

07.0 DEMONSTRATE PROFICIENCY IN LINE AND BENCH MAINTENANCE OF AIRBORNE COMMUNICATION SYSTEMS--The student will be able to:

07.01 Describe theory of operation of air to ground communication systems.
07.02 Determine serviceability through performance checks of avionics communication systems.
07.03 Troubleshoot to the component/module level malfunctioning communication systems/equipment.
07.04 Repair and return to service air to ground communication systems/equipment.
07.05 Analyze and troubleshoot communication transmitter switching and audio distribution circuits and equipment.
07.06 Describe the theory of operation of emergency locator transmitters (ELTs).
07.07 Perform preventive and regulatory maintenance and performance tests on ELTs.
07.08 Troubleshoot defective ELTs, repair, and return to service.

08.0 DEMONSTRATE PROFICIENCY IN LINE AND BENCH MAINTENANCE OF AIRBORNE RADIO NAVIGATION SYSTEMS AND EQUIPMENT--The student will be able to:

08.01 Describe the principles and theory of operation of VHF omnirange receivers, converters, and indicators.

08.02 Determine through performance checks, the serviceability of VHF omnirange systems.
08.03 Troubleshoot to the component/module level malfunctioning omnirange systems.
08.04 Repair and return to service omnirange systems equipment.
08.05 Describe the principles and theory of operation of instrument landing systems (ILS).
08.06 Determine through performance checks the serviceability of localizer, glideslope, and marker beacon recievers, converters, and indicators.
08.07 Troubleshoot to the component/module level malfunctioning ILS systems and equipment.
08.08 Repair and return to service ILS systems and equipment.
08.09 Describe the principles of operation of microwave landing systems.
08.10 Describe the principles and theory of operation of Automatic Direction Finders (ADF).
08.11 Determine through performance checks the serviceability of ADF systems.
08.12 Troubleshoot to the component/module level malfunctioning ADF systems.
08.13 Repair and return to service ADF systems.
08.14 Describe radio navigation systems/equipment interface with other aircraft instruments and systems.

09.0 DEMONSTRATE PROFICIENCY IN LINE AND BENCH MAINTENANCE OF AIRBORNE RADAR SYSTEMS--The student will be able to:

09.01 Describe the principles and theory of operation of Air Traffic Control (ATC) transponders and altitude encoders.
09.02 Determine through performance checks the serviceability of ATC transponders and altitude encoders.
09.03 Troubleshoot to the component/module level ATC transponders.
09.04 Repair and return to service ATC transponders.
09.05 Describe the principles and theory of operation and Distance Measurements Equipment (DME).
09.06 Determine through performance checks the serviceability of DME systems.
09.07 Troubleshoot to the component/module level malfunctioning DME systems.
09.08 Repair and return to service DME systems.
09.09 Describe the principles and basic theory of operation of weather radar systems.
09.10 Describe the basic principles of operation of the 3M/RYAN Stormscope.

10.0 DEMONSTRATE PROFICIENCY IN THE PRINCIPLES OF OPERATION OF AREA NAVIGATION (R-NAV) SYSTEMS--The student will be able to:

10.01 Describe the principles of operation of VHF R-Nav systems (VOR-DME).
10.02 Describe the principles of operation of hyperbolic R-Nav systems (Loran C) (Omega/VAF).

11.0 DEMONSTRATE PROFICIENCY IN INSTALLING AVIONICS SYSTEMS--The student will be able to:

11.01 Draw an interconnecting diagram and interconnect an IFR Avionics system for a single engine or light twin aircraft using acceptable methods, techniques, and practices.
11.02 Determine proper placement of the various antennas required for an IFR Avionics package on a light twin or single engine aircraft.

11.03 Describe the effects of precipitation static on aircraft radios and standard methods of reduction.
11.04 Compute the dimensions of an ADF Sense antenna for a typical installation.
11.05 Apply the formula for weight and balance computation.

12.0 DEMONSTRATE PROFICIENCY IN THE CALIBRATION OF TEST EQUIPMENT--The student will be able to:

12.01 Describe the regulatory requirements for repair station test equipment calibration.
12.02 Calibrate frequency counters/meters.
12.03 Calibrate general purpose multimeters.
12.04 Calibrate RF voltmeters.
12.05 Calibrate RF powermeters, wattmeters, loads, and attenuators.
12.06 Calibrate audio signal generators and power meters.
12.07 Calibrate oscilloscopes.
12.08 Calibrate power supplies.
12.09 Calibrate RF signal generators.
12.10 Calibrate special purpose test sets normally used in an Avionics Repair Station.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Identify characteristics of the American enterprise system.
17.02 Define inflation and deflation.
17.03 Illustrate the basic economic questions facing any society.
17.04 Determine the results of a change in demand or a change in supply.
17.05 List factors which contribute to economic growth.
17.06 Identify characteristics of different types of business ownership.
17.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Barbering

CODE NUMBER: Secondary 8757100 Postsecondary I120402

Florida CIP 0612.040200

SECONDARY SCHOOL CREDITS 8

COLLEGE CREDITS ______

POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: BARBERING @ 7 G PERS SERV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as barbers (68002443), or to provide supplemental training for persons previously or currently employed in this occupation. Instruction is designed to qualify students for employment upon successfully passing the Florida Barber License Examination.

The content includes, but is not limited to, communication skills, leadership skills, human relations skills and employability skills, safe and efficient work practices; Florida barber law and rules, acquisition of knowledge of barber and its related chemistry, bacteriology, anatomy and physiology; development of skill in performing the manipulative technique required in the practice of barbering.

Listed below are the courses that comprise this program when offered at the secondary level:

8757110	Barbering 1
8757120	Barbering 2
8757130	Barbering 3
8757140	Barbering 4
8757150	Barbering 5
8757160	Barbering 6
8757170	Barbering 7
8757180	Barbering 8

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experience with tools and chemicals appropriate to the program content and in accordance with current practices in the trade, and includes cutting, shampooing and styling hair, and shaving with special attention to hygiene, skin and scalp disease, and equipment sterilization.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The outcomes and student performance standards which the handicapped

student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The length of this program is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate safe and efficient work practices.
02. Identify and perform shampooing and conditioning of hair.
03. Identify and perform trimming, shaping hair using clippers, shears and razors.
04. Identify and perform hair styles.
05. Identify and perform straightening of hair.
06. Identify and perform permanent waving of hair.
07. Identify and prepare hair pieces and wigs.
08. Identify and perform hair coloring.
09. Identify and perform mustache and beard styling.
10. Demonstrate shaving the face.
11. Perform face, neck and scalp massage.
12. Perform facial treatments.
13. Develop barber management skills.
14. Demonstrate employability skills.
15. Demonstrate knowledge of state board requirements.
16. Demonstrate appropriate communication skills.
17. Demonstrate appropriate math skills.
18. Demonstrate appropriate understanding of basic science.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8757100

PROGRAM TITLE: Barbering POSTSECONDARY NUMBER: I120402

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM SHAMPOOING AND CONDITIONING OF HAIR--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM TRIMMING, SHAPING HAIR USING CLIPPERS, SHEARS AND RAZORS- The student will be able to:

03.01 Prepare the patron.
03.02 Determine customer desires and needs (basic/style).
03.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
03.04 Section hair and cut guidelines.
03.05 Proceed with desired hair cut.
03.06 Check completed hair cut.

04.0 IDENTIFY AND PERFORM HAIR STYLES--The student will be able to:

04.01 Prepare the patron and determine desired style.
04.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
04.03 Prepare and perform heat styling using either blow dryers, curling. irons, straightening combs, pressing irons, or electric rollers.
04.04 Comb into style.

05.0 IDENTIFY AND PERFORM STRAIGHTENING OF HAIR--The student will be able to:

05.01 Prepare the patron and analyze hair.
05.02 Select appropriate chemical materials and follow manufacturing directions.
05.03 Section and apply chemicals.
05.04 Test for desired results.
05.05 Rinse, shampoo and style the hair.

06.0 IDENTIFY AND PERFORM PERMANENT WAVING OF HAIR--The student will be able to:

06.01 Prepare the patron and analyze hair.

06.02 Determine customer desires and needs.
06.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
06.04 Perform pre-permanent shampoo and shaping.
06.05 Section and wrap hair properly.
06.06 Apply protective cream or lotion; apply cotton to hairline.
06.07 Apply perm solution and process; take test curls.
06.08 Rinse, blot, and neutralize; rinse again.
06.09 Remove rods, condition, and style; record results.

07.0 IDENTIFY AND PREPARE HAIR PIECES AND WIGS--The student will be able to:

07.01 Determine and identify styles and colors of wigs and hair pieces.
07.02 Measure the head and fit wig or hair piece.
07.03 Clean, shape, and style to patron's features.

08.0 IDENTIFY AND PERFORM HAIR COLORING--The student will be able to:

08.01 Prepare tint.
08.02 Apply selected tint for retouch or virgin hair.
08.03 Process, rinse, and shampoo.
08.04 Condition, if needed.
08.05 Style; record results.

09.0 IDENTIFY AND PERFORM MUSTACHE AND BEARD STYLING--The student will be able to:

09.01 Prepare the patron.
09.02 Identify the design suitable mustache and/or beard style of the nose and face.
09.03 Perform the procedure for trimming a mustache or trimming a beard.
09.04 Remove clipped beard from face and neck.

10.0 DEMONSTRATE SHAVING THE FACE--The student will be able to:

10.01 Prepare patron for shaving.
10.02 Perform the shaving of the patron's face.
10.03 Perform the final cleansing of face and neck.

11.0 PERFORM FACE, NECK AND SCALP MASSAGE--The student will be able to:

11.01 Prepare the patron.
11.02 Diagnose and identify skin condition.
11.03 Cleanse face and neck.
11.04 Perform massage.
11.05 Perform final cleansing.

12.0 PERFORM FACIAL TREATMENTS--The student will be able to:

12.01 Prepare the patron.
12.02 Diagnose and identify skin condition.
12.03 Assemble supplies and equipment.
12.04 Cleanse face and neck.
12.05 Perform designated treatment (mechanical or manual).
12.06 Perform final cleansing of face and neck.

13.0 DEMONSTRATE BARBER MANAGEMENT SKILLS--The student will be able to:

13.01 Assist employees in setting personal goals.
13.02 Set shop goals and organize salon.
13.03 Develop operating budget.
13.04 Select workable site/location for salon.

13.05 Design physical layout and equipment list for salon (within budget limitations).
13.06 Prepare and implement marketing and advertising plan.
13.07 Prepare and implement sales plan.
13.08 Develop and maintain an appropriate accounting system.
13.09 Comply with state and local laws, rules, and regulations.
13.10 Develop an adequate insurance coverage plan.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

15.01 Complete Florida's State Board license examination.
15.02 Display Florida's Barbering License.

16.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

16.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
16.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
16.03 Read and follow written and oral instructions.
16.04 Answer and ask questions coherently and concisely.
16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
16.06 Demonstrate appropriate telephone/communication skills.

17.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

17.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
17.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
17.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
17.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
17.05 Demonstrate an understanding of federal, state and local taxes and their computation.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

18.02 Draw conclusions or make inferences from data.
18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 1 COURSE NUMBER: 8757110

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom/laboratory procedures. It provides competencies in hair shampooing and conditioning, trimming and shaping hair using clippers, shears and razors.

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM SHAMPOOING AND CONDITIONING OF HAIR--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM TRIMMING, SHAPING HAIR USING CLIPPERS, SHEARS AND RAZORS--The student will be able to:

03.01 Prepare the patron.
03.02 Determine customer desires and needs (basic/style).
03.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
03.04 Section hair and cut guidelines.
03.05 Proceed with desired hair cut.
03.06 Check completed hair cut.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Barbering
PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 2
COURSE NUMBER: 8757120

COURSE DESCRIPTION:

This course is designed to provide competencies in hair styling and hair straightening.

04.0 IDENTIFY AND PERFORM HAIR STYLES--The student will be able to:

- 04.01 Prepare the patron and determine desired style.
- 04.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
- 04.03 Prepare and perform heat styling using either blow dryers, curling. irons, straightening combs, pressing irons, or electric rollers.
- 04.04 Comb into style.

05.0 IDENTIFY AND PERFORM STRAIGHTENING OF HAIR--The student will be able to:

- 05.01 Prepare the patron and analyze hair.
- 05.02 Select appropriate chemical materials and follow manufacturing directions.
- 05.03 Section and apply chemicals.
- 05.04 Test for desired results.
- 05.05 Rinse, shampoo and style the hair.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 3 COURSE NUMBER: 8757130

COURSE DESCRIPTION:

This course is designed to provide competencies in permanent waving of hair and preparation and styling of hair pieces and wigs.

06.0 IDENTIFY AND PERFORM PERMANENT WAVING OF HAIR--The student will be able to:

06.01 Prepare the patron and analyze hair.
06.02 Determine customer desires and needs.
06.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
06.04 Perform pre-permanent shampoo and shaping.
06.05 Section and wrap hair properly.
06.06 Apply protective cream or lotion; apply cotton to hairline.
06.07 Apply perm solution and process; take test curls.
06.08 Rinse, blot, and neutralize; rinse again.
06.09 Remove rods, condition, and style; record results.

07.0 IDENTIFY AND PREPARE HAIR PIECES AND WIGS--The student will be able to:

07.01 Determine and identify styles and colors of wigs and hair pieces.
07.02 Measure the head and fit wig or hair piece.
07.03 Clean, shape, and style to patron's features.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Barbering
PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 4
COURSE NUMBER: 8757140

COURSE DESCRIPTION:
This course is designed to provide competencies in all phases of hair coloring.

08.0 IDENTIFY AND PERFORM HAIR COLORING--The student will be able to:

08.01 Prepare tint.
08.02 Apply selected tint for retouch or virgin hair.
08.03 Process, rinse, and shampoo.
08.04 Condition, if needed.
08.05 Style; record results.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 5 COURSE NUMBER: 8757150

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in mustache and beard styling.

09.0 IDENTIFY AND PERFORM MUSTACHE AND BEARD STYLING--The student will be able to:

09.01 Prepare the patron.
09.02 Identify the design suitable mustache and/or beard style of the nose and face.
09.03 Perform the procedure for trimming a mustache or trimming a beard.
09.04 Remove clipped beard from face and neck.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 6 COURSE NUMBER: 8757160

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in shaving the face and face, neck and scalp massage and facial treatments.

10.0 DEMONSTRATE SHAVING THE FACE--The student will be able to:

10.01 Prepare patron for shaving.
10.02 Perform the shaving of the patron's face.
10.03 Perform the final cleansing of face and neck.

11.0 PERFORM FACE, NECK AND SCALP MASSAGE--The student will be able to:

11.01 Prepare the patron.
11.02 Diagnose and identify skin condition.
11.03 Cleanse face and neck.
11.04 Perform massage.
11.05 Perform final cleansing.

12.0 PERFORM FACIAL TREATMENTS--The student will be able to:

12.01 Prepare the patron.
12.02 Diagnose and identify skin condition.
12.03 Assemble supplies and equipment.
12.04 Cleanse face and neck.
12.05 Perform designated treatment (mechanical or manual).
12.06 Perform final cleansing of face and neck.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 7 COURSE NUMBER: 8757170

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in barber management skills.

13.0 DEMONSTRATE BARBER MANAGEMENT SKILLS--The student will be able to:

13.01 Assist employees in setting personal goals.
13.02 Set shop goals and organize salon.
13.03 Develop operating budget.
13.04 Select workable site/location for salon.
13.05 Design physical layout and equipment list for salon (within budget limitations).
13.06 Prepare and implement marketing and advertising plan.
13.07 Prepare and implement sales plan.
13.08 Develop and maintain an appropriate accounting system.
13.09 Comply with state and local laws, rules, and regulations.
13.10 Develop an adequate insurance coverage plan.

16.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

16.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
16.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
16.03 Read and follow written and oral instructions.
16.04 Answer and ask questions coherently and concisely.
16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
16.06 Demonstrate appropriate telephone/communication skills.

17.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

17.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
17.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
17.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
17.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
17.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 8 COURSE NUMBER: 8757180

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in employability skills and the study of the barbering law and rules. The student will be knowledgeable to the requirements of the state board examination.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

15.01 Complete Florida's State Board license examination.
15.02 Display Florida's Barbering License.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
18.02 Draw conclusions or make inferences from data.
18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Barge and Boat Operation

CODE NUMBER: Secondary 8751100 Postsecondary I490302

Florida CIP 0649.030200

SECONDARY
SCHOOL CREDITS 3 COLLEGE CREDITS ___ POSTSECONDARY ADULT
VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 x 9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: SEAMANSHIP @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as ship, boat and barge mates (97505938), ship mates (197.133-022), boatswains (911.131-010), deck hands (911.687.022), or to provide supplemental training for persons previously or currently employed in these occupations.

The plan of instruction prepares individuals for crew duties on fresh water and seagoing boats, barges and ships. Included are boat navigation, operation, maintenance, loading and unloading, and emergency procedures.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8751110	Barge and Boat Operation 1
8751120	Barge and Boat Operation 2
8751130	Barge and Boat Operation 3

II. LABORATORY ACTIVITIES: Laboratory and onboard activities are an integral part of this program and provide instruction in the safe and efficient operation of commercial watercraft and related systems. Emphasis is placed on vessel operation. Vehicle towing duties may be taught as a local option.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the cooperative occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Dock a vessel.
02. Undock and get vessel underway.
03. Operate vessel at sea.
04. Maneuver around offshore structures.
05. Anchor vessel.
06. Manage and perform cargo handling duties.
07. Bring vessel into port.
08. Perform crew operational and maintenance duties aboard vessel in port.
09. Prepare meals aboard vessel.
10. Plan and perform emergency procedures.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education   SECONDARY NUMBER: 8751100

PROGRAM TITLE: Barge and Boat Operation   POSTSECONDARY NUMBER: I490302

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard towing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure a propeller shaft.

02.0 UNDOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from berth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil in engines.
03.06 Change oil and fuel filters on engines.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different towing situations.
03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine Greenwich Mean Time (GMT) by using vessel's chronometer.
03.14 Determine position by using omega navigation system.

03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.
03.19 Plot position by using loran and loran overprint charts.
03.20 Set sea watches.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hawsers, or mooring lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tide and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.
06.06 Load cargo by using bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

07.0 BRING VESSEL INTO PORT--The student will be able to:

07.01 Determine approximate position and hazardous bottom conditions by using pathometer.
07.02 Determine position by using radio direction finder (RDF).
07.03 Inspect engine room equipment for proper maintenance and safety.
07.04 Determine vessel's course and position against dead reconing plots.
07.05 Correct nautical chart prior to departure.
07.06 Prepare vessel to take on fuel and lube oil.
07.07 Prepare to take on water aboard vessel.

08.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

08.01 Arrange for dry docking vessel.
08.02 Change brushes in auxiliary engines.
08.03 Change lube oil filters on auxiliary engines.
08.04 Change fuel filters on auxiliary engines.
08.05 Determine if motor bearings are excessively warn.
08.06 Clean electric motor.
08.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
08.08 Determine if const-a-voltage regulator is functioning properly.
08.09 Determine if drive belts on air compressors are excessively loose.
08.10 Tighten panel box fittings to prevent vibration.
08.11 Clean keel cool strainers.
08.12 Clean oil coolers.

08.13 Clean oil strainers in marine gears.
08.14 Drain water out of fuel traps.
08.15 Tighten fuel and oil line connections on engines.
08.16 Inspect day tanks containing fuel for leaks.
08.17 Lubricate deck and engine room equipment on a regular schedule.
08.18 Determine vessel's manning requirements.
08.19 Splice eye into line.
08.20 Wash down vessel's superstructure and decks.

09.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

09.01 Make yeast breads, biscuits, and cornbread.
09.02 Make pie crust.
09.03 Make cream filling for pie.
09.04 Make pancakes.
09.05 Make cakes.
09.06 Cook vegetables by boiling, simmering, and steaming.
09.07 Cook meat, fish, and fowl by broiling.
09.08 Cook meat, seafood, and fowl by braising.
09.09 Cook meat, fish, and fowl by roasting or baking.
09.10 Season and bread meat, seafood, and fowl for baking, roasting, broiling, and frying.
09.11 Cook eggs by frying and scrambling.
09.12 Make gravies.
09.13 Make coffee.
09.14 Make salads.
09.15 Prepare soup stock.
09.16 Prepare sandwiches.
09.17 Prepare dehydrated or concentrated foods.
09.18 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
09.19 Carve cooled meat.
09.20 Cut trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
09.21 Clean and care for equipment.
09.22 Order food.
09.23 Plan menus.
09.24 Keep records for purchasing foods.
09.25 Store food.
09.26 Keep continuous inventory of food items.

10.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

10.01 Act as lookout to keep person in sight who has been lost overboard.
10.02 Administer first aid to prevent shock.
10.03 Administer first aid to control bleeding.
10.04 Administer CPR.
10.05 Launch lifeboat and life raft.
10.06 Close emergency fuel shutoff valves.
10.07 Extinguish class C fire.
10.08 Maneuver life raft or lifeboat away from vessel.
10.09 Maneuver vessel to return to area in which person was lost overboard.
10.10 Issue life preservers for use by passengers and crew.
10.11 Secure engine room to prevent spread of fire.
10.12 Send out distress signals.
10.13 Sound abandon - ship alarm.
10.14 Train crew to perform emergency procedures.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

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11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.

15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education | COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation | PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 1 | COURSE NUMBER: 8751110

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for mooring a vessel, the securing of a vessel, and the related duties of inspecting, testing and securing equipment, all related safety rules and procedures performed before getting a vessel underway.

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard towing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure a propeller shaft.

02.0 UNDOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from berth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tide and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.

06.06 Load cargo by using bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

10.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

10.01 Act as lookout to keep person in sight who has been lost overboard.
10.02 Administer first aid to prevent shock.
10.03 Administer first aid to control bleeding.
10.04 Administer CPR.
10.05 Launch lifeboat and life raft.
10.06 Close emergency fuel shutoff valves.
10.07 Extinguish class C fire.
10.08 Maneuver life raft or lifeboat away from vessel.
10.09 Maneuver vessel to return to area in which person was lost overboard.
10.10 Issue life preservers for use by passengers and crew.
10.11 Secure engine room to prevent spread of fire.
10.12 Send out distress signals.
10.13 Sound abandon - ship alarm.
10.14 Train crew to perform emergency procedures.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation
PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 2
COURSE NUMBER: 8751120

COURSE DESCRIPTION:

This course is designed to provide instruction of all duties performed while a vessel is at sea. The inspection of electrical systems, preventative maintenance of all engines, vessel lines and rigging, the determination of position, and arrival time, the safe assistance in boarding and discharging of personnel, passengers and cargo, and the safe securing of all lashing, hawsers, lines and rigging.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil in engines.
03.06 Change oil and fuel filters on engines.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different towing situations.
03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine greenwich mean time (GMT) by using vessel's chronometer.
03.14 Determine position by using omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.

03.19 Plot position by using loran and loran overprint charts.
03.20 Set sea watches.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hawsers, or mooring lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

07.0 BRING VESSEL INTO PORT--The student will be able to:

07.01 Determine approximate position and hazardous bottom conditions by using pathometer.
07.02 Determine position by using radio direction finder (RDF).
07.03 Inspect engine room equipment for proper maintenance and safety.
07.04 Determine vessel's course and position against dead reconing plots.
07.05 Correct nautical chart prior to departure.
07.06 Prepare vessel to take on fuel and lube oil.
07.07 Prepare to take on water aboard vessel.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation
PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 3
COURSE NUMBER: 8751130

COURSE DESCRIPTION:

This course is designed to provide instruction in duties and techniques of anchoring a vessel properly, the management duties and techniques of handling cargo for leading, storing, and unloading safely.

08.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

08.01 Arrange for dry docking vessel.
08.02 Change brushes in auxiliary engines.
08.03 Change lube oil filters on auxiliary engines.
08.04 Change fuel filters on auxiliary engines.
08.05 Determine if motor bearings are excessively warn.
08.06 Clean electric motor.
08.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
08.08 Determine if const-a-voltage regulator is functioning properly.
08.09 Determine if drive belts on air compressors are excessively loose.
08.10 Tighten panel box fittings to prevent vibration.
08.11 Clean keel cool strainers.

08.12 Clean oil coolers.
08.13 Clean oil strainers in marine gears.
08.14 Drain water out of fuel traps.
08.15 Tighten fuel and oil line connections on engines.
08.16 Inspect day tanks containing fuel for leaks.
08.17 Lubricate deck and engine room equipment on a regular schedule.
08.18 Determine vessel's manning requirements.
08.19 Splice eye into line.
08.20 Wash down vessel's superstructure and decks.

09.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

09.01 Make yeast breads, biscuits, and cornbread.
09.02 Make pie crust.
09.03 Make cream filling for pie.
09.04 Make pancakes.
09.05 Make cakes.
09.06 Cook vegetables by boiling, simmering, and steaming.
09.07 Cook meat, fish, and fowl by broiling.
09.08 Cook meat, seafood, and fowl by braising.
09.09 Cook meat, fish, and fowl by roasting or baking.
09.10 Season and bread meat, seafood, and fowl for baking, roasting, broiling, and frying.
09.11 Cook eggs by frying and scrambling.
09.12 Make gravies.
09.13 Make coffee.
09.14 Make salads.
09.15 Prepare soup stock.
09.16 Prepare sandwiches.
09.17 Prepare dehydrated or concentrated foods.
09.18 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
09.19 Carve cooled meat.
09.20 Cut trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
09.21 Clean and care for equipment.
09.22 Order food.
09.23 Plan menus.
09.24 Keep records for purchasing foods.
09.25 Store food.
09.26 Keep continuous inventory of food items.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing

CODE NUMBER: Secondary 8709000 Postsecondary ______

Florida CIP 0647.062300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30, 31

CERTIFICATION COVERAGE: AUTO IND @ 7 G AUTO BODY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automotive body, related repairers (85305631), automobile body repairers (807.381-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic trade skills,; refinishing skills; sheetmetal repair skills; related welding skills; use of plastic fillers; paint systems and undercoats; and minor miscellaneous repairs. The course content should also include skills training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8709010	Basic Automotive Body Repair and Refinishing 1
8709020	Basic Automotive Body Repair and Refinishing 2
8709030	Basic Automotive Body Repair and Refinishing 3
8709040	Basic Automotive Body Repair and Refinishing 4
8709050	Basic Automotive Body Repair and Refinishing 5
8709060	Basic Automotive Body Repair and Refinishing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: use of hand and power tools; panel repairs; use of frame measurement equipment; application of fillers; paint systems; use of shop materials; glass replacement; and use of MIG, oxyacetylene and plastic welders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences;

a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

This program serves as the Florida automotive collision repair common core program and its content is compatible with and a prerequisite for advanced skills contained in the PSAV program, Automotive Body Repair and Refinishing.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate shop and occupational safety skills
02. Prepare vehicles for repair and refinishing.
03. Repair, replace and adjust outer body panels.
04. Prepare parts and panels for metal finishing.
05. Prepare and apply body fillers.
06. Perform welding operations.
07. Setup vehicle for pulling and measuring.
08. Prepare surfaces for refinishing.
09. Maintain and operate spray equipment.
10. Select and apply appropriate paints and finishes.
11. Perform miscellaneous repairs.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8709000

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing POSTSECONDARY NUMBER:

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Comply with safety rules regarding chemicals.
01.02 Comply with safety rules regarding personal clothing and devices.
01.03 Comply with safety rules regarding hand tools and power equipment.
01.04 Comply with shop safety rules and regulations.
01.05 Identify sources of air borne contamination and other hazards; take necessary steps to protect the health of the painter and other personnel.
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation.
01.07 Identify career opportunities in auto body repair.
01.08 Explain requirements for continuing education in auto body repair.

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Remove damaged outside trim and moldings.
02.02 Remove damaged or necessary inside trim and moldings.
02.03 Remove damaged, nonstructural body panels and components that may interfere with, or be damaged during repair.
02.04 Protect panels and parts adjacent to repair areas to prevent damage.
02.05 Remove dirt, corrosion, undercoatings, sealers and/or other protective coatings necessary to perform repairs to structural areas.
02.06 Remove repairable plastics and other parts that are recommended for off car repair.
02.07 Store reusable parts and fasteners removed from vehicle.

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able to:

03.01 Remove and replace a bolted panel or panel assembly.
03.02 Remove and replace hoods, hood hinges and hood latches.
03.03 Remove and replace deck lids, lid hinges and lid latches.
03.04 Remove and replace doors, tailgates, hatches, lift gates and hinges.
03.05 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil filled energy-absorbing-type bumper isolators that are being discarded).
03.06 Check and adjust hood clearances to adjoining panels.
03.07 Check and adjust deck lid, lift gate and hatch clearances to adjoining panels.
03.08 Check door hinge condition; check door frames for square, check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders and tops.
03.09 Check and adjust latch assemblies on all hinged components.
03.10 Check and adjust bumper clearances to adjacent body and filler panels.
03.11 Straighten roughed out contours of damaged panels to a surface condition for body filling or metal finishing.
03.12 Weld cracked or torn steel body panels,; reweld broken welds.

03.13 Cold shrink stretched panel areas back to contour.
03.14 Restore protective coatings and sealants.

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles.
04.02 Identify heat effects on metals.
04.03 Identify the importance of maintaining the structural integrity of an auto body.
04.04 Grind the paint from the damaged area of a body panel.
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities.
04.06 Disc sand the repaired body panel to produce final smoothness.

05.0 PREPARE AND APPLY BODY FILLERS--The student will be able to:

05.01 Mix filler.
05.02 Apply body filler and cheese grate during curing.
05.03 Rough sand cured body filler to contour and then finish sand.

06.0 PERFORM WELDING OPERATIONS--The student will be able to:

06.01 Setup, operate and maintain metal inert gas (MIG) welding equipment.
06.02 Perform various welds with MIG equipment including plug, butt, and lap.
06.03 Setup, operate, and maintain oxycetaline welding equipment.
06.04 Perform various welding, cutting, and heating techniques with oxyacetylene equipment.

07.0 SETUP VEHICLE FOR MEASURING AND PULLING--The student will be able to:

07.01 Plan methods and order of repair.
07.02 Mount vehicle on anchoring equipment.
07.03 Measure vehicle damage.
07.04 Attach pulling equipment.

08.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

08.01 Inspect and identify types of finishes and surface conditions and develop a plan for refinishing.
08.02 Remove and store trim and molding.
08.03 Remove dirt, wax, and road grime from areas to be refinished and from adjacent surfaces.
08.04 Mask trim and other areas that will not be refinished.
08.05 Remove paint finishes (chemically or mechanically).
08.06 Dry or wet sand areas to be refinished.
08.07 Featheredge broken areas to be refinished.
08.08 Identify types of metals and apply suitable metal treatments.
08.09 Mix primer, primer surfacer or primer sealer and spray onto the surface of repaired areas.
08.10 Apply glazing putty to pinholes, scratches, and other minor surface imperfections.
08.11 Dry- or wet sand areas to which primer surfacer and glazing putty have been applied.
08.12 Compound around the edges of repaired areas to be refinished.
08.13 Blow dust from areas to be refinished including cracks or moldings of adjacent areas.
08.14 Clean area to be refinished with a proper solvent.
08.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished.

08.16 Apply suitable sealers to the areas being refinished when sealing is needed or desirable.
08.17 Identify and correct finish defects.

09.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

09.01 Check and adjust air pressure at the spray gun.
09.02 Adjust spray gun fluid and pattern control valves.
09.03 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
09.04 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, and compressors).

10.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

10.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components.
10.02 Determine the type and color of paint already on a vehicle.
10.03 Shake, stir, thin or reduce, and strain paint.
10.04 Apply acrylic enamel for spot repairs.
10.05 Apply acrylic enamel for panel repairs.
10.06 Apply acrylic enamel for overall refinishing.
10.07 Apply acrylic lacquer for spot repairs.
10.08 Apply acrylic lacquer for panel repairs.
10.09 Check for color matching of all applied materials.
10.10 Sand, buff, and polish finishes where necessary.
10.11 Identify the types of plastic parts to be finished and determine the proper refinishing procedure.
10.12 Apply a finish coat to plastic parts.
10.13 Clean, condition, and refinish vinyl (e.g. upholstery, dashes, and tops).
10.14 Clean and detail a vehicle after completion of refinishing.
10.15 Apply stone chip resistant coatings to lower body areas.
10.16 Restore corrosion resistant coatings, caulking, and seam sealers to repaired areas.
10.17 Identify and correct paint application problems.

11.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

11.01 Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
11.02 Diagnose and repair water leaks, dust leaks, and wind noises.
11.03 Inspect, repair or replace weather stripping.
11.04 Inspect, remove, and replace all stationary glass (including windshields, back lights, etc.) using manufacturers' recommended installation materials and procedures.
11.05 Repair damaged circuits and wires.
11.06 Align headlamps.
11.07 Apply rust repair methods including grinding, sandblasting, and metal preparation.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly

used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:
13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Automotive Body Repair and Refinishing	PROGRAM NUMBER:	8709000
COURSE TITLE:	Basic Automotive Body Repair and Refinishing 1	COURSE NUMBER:	8709010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating shop and occupational safety skills and employability skills, and comprehending and complying with requirements concerning legal liability and consequent insurance implications.

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Comply with safety rules regarding chemicals.
01.02 Comply with safety rules regarding personal clothing and devices.
01.03 Comply with safety rules regarding hand tools and power equipment.
01.04 Comply with shop safety rules and regulations.
01.05 Identify sources of air borne contamination and other hazards; take necessary steps to protect the health of the painter and other personnel.
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation.
01.07 Identify career opportunities in auto body repair.
01.08 Explain requirements for continuing education in auto body repair.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing
PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 2
COURSE NUMBER: 8709020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for preparing vehicles for repair and refinishing and repair, replacement and adjustment of outer body panels.

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Remove damaged outside trim and moldings.
02.02 Remove damaged or necessary inside trim and moldings.
02.03 Remove damaged, nonstructural body panels and components that may interfere with, or be damaged during, repair.
02.04 Protect panels and parts adjacent to repair areas to prevent damage.
02.05 Remove dirt, corrosion, undercoatings, sealers and/or other protective coatings necessary to perform repairs to structural areas.
02.06 Remove repairable plastics and other parts that are recommended for off car repair.
02.07 Store reusable parts and fasteners removed from vehicle.

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able to:

03.01 Remove and replace a bolted panel or panel assembly.
03.02 Remove and replace hoods, hood hinges and hood latches.
03.03 Remove and replace deck lids, lid hinges and lid latches.
03.04 Remove and replace doors, tailgates, hatches, lift gates and hinges.
03.05 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil filled energy-absorbing-type bumper isolators that are being discarded).
03.06 Check and adjust hood clearances to adjoining panels.
03.07 Check and adjust deck lid, lift gate and hatch clearances to adjoining panels.
03.08 Check door hinge condition; check door frames for square, check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders and tops.
03.09 Check and adjust latch assemblies on all hinged components.
03.10 Check and adjust bumper clearances to adjacent body and filler panels.
03.11 Straighten roughed out contours of damaged panels to a surface condition for body filling or metal finishing.
03.12 Weld cracked or torn steel body panels,; reweld broken welds.
03.13 Cold shrink stretched panel areas back to contour.
03.14 Restore protective coatings and sealants.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Automotive Body Repair and Refinishing	PROGRAM NUMBER:	8709000
COURSE TITLE:	Basic Automotive Body Repair and Refinishing 3	COURSE NUMBER:	8709030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for preparing parts and panels for metal finishing, applying body fillers, and performing welding operations.

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles.
04.02 Identify heat effects on metals.
04.03 Identify the importance of maintaining the structural integrity of an auto body.
04.04 Grind the paint from the damaged area of a body panel.
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities.
04.06 Disc sand the repaired body panel to produce final smoothness.

05.0 PREPARE AND APPLY BODY FILLERS--The student will be able to:

05.01 Mix filler.
05.02 Apply body filler and cheese grate during curing.
05.03 Rough sand cured body filler to contour and then finish sand.

06.0 PERFORM WELDING OPERATIONS--The student will be able to:

06.01 Setup, operate and maintain metal inert gas (MIG) welding equipment.
06.02 Perform various welds with MIG equipment including plug, butt, and lap.
06.03 Setup, operate, and maintain oxyacetylene welding equipment.
06.04 Perform various welding, cutting, and heating techniques with oxyacetylene equipment.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and

industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing — PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 4 — COURSE NUMBER: 8709040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up vehicle for measuring and pulling and for preparing surfaces for refinishing.

07.0 SETUP VEHICLE FOR MEASURING AND PULLING--The student will be able to:

07.01 Plan methods and order of repair.
07.02 Mount vehicle on anchoring equipment.
07.03 Measure vehicle damage.
07.04 Attach pulling equipment.

08.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

08.01 Inspect and identify types of finishes and surface conditions and develop a plan for refinishing.
08.02 Remove and store trim and molding.
08.03 Remove dirt, wax, and road grime from areas to be refinished and from adjacent surfaces.
08.04 Mask trim and other areas that will not be refinished.
08.05 Remove paint finishes (chemically or mechanically).
08.06 Dry- or wet sand areas to be refinished.
08.07 Featheredge broken areas to be refinished.
08.08 Identify types of metals and apply suitable metal treatments.
08.09 Mix primer, primer surfacer or primer sealer and spray onto the surface of repaired areas.
08.10 Apply glazing putty to pinholes, scratches, and other minor surface imperfections.
08.11 Dry or wet sand areas to which primer surfacer and glazing putty have been applied.
08.12 Compound around the edges of repaired areas to be refinished.
08.13 Blow dust from areas to be refinished including cracks or moldings of adjacent areas.
08.14 Clean area to be refinished with a proper solvent.
08.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished.
08.16 Apply suitable sealers to the areas being refinished when sealing is needed or desirable.
08.17 Identify and correct finish defects.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 5 COURSE NUMBER: 8709050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and operating spray equipment, selecting and applying appropriate paints and finishes and diagnosing and correcting paint application problems.

09.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

09.01 Check and adjust air pressure at the spray gun.
09.02 Adjust spray gun fluid and pattern control valves.
09.03 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
09.04 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, and compressors).

10.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

10.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components.
10.02 Determine the type and color of paint already on a vehicle.
10.03 Shake, stir, thin or reduce, and strain paint.
10.04 Apply acrylic enamel for spot repairs.
10.05 Apply acrylic enamel for panel repairs.
10.06 Apply acrylic enamel for overall refinishing.
10.07 Apply acrylic lacquer for spot repairs.
10.08 Apply acrylic lacquer for panel repairs.
10.09 Check for color matching of all applied materials.
10.10 Sand, buff, and polish finishes where necessary.
10.11 Identify the types of plastic parts to be finished and determine the proper refinishing procedure.
10.12 Apply a finish coat to plastic parts.
10.13 Clean, condition, and refinish vinyl (e.g. upholstery, dashes, and tops).
10.14 Clean and detail a vehicle after completion of refinishing.
10.15 Apply stone chip resistant coatings to lower body areas.
10.16 Restore corrosion resistant coatings, caulking, and seam sealers to repaired areas.
10.17 Identify and correct paint application problems.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing

PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 6

COURSE NUMBER: 8709060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing miscellaneous repairs.

11.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

11.01 Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
11.02 Diagnose and repair water leaks, dust leaks, and wind noises.
11.03 Inspect, repair or replace weather stripping.
11.04 Inspect, remove, and replace all stationary glass (including windshields, back lights, etc.) using manufacturers' recommended installation materials and procedures.
11.05 Repair damaged circuits and wires.
11.06 Align headlamps.
11.07 Apply rust repair methods including grinding, sandblasting, and metal preparation.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able o:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing

CODE NUMBER: Secondary 8751300 Postsecondary _______

Florida CIP 0649.032601

SECONDARY SCHOOL CREDITS __6__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: SEAMANSHIP @ 7 G CARPENTRY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as precision woodworkers (89399709), boat patchers/plasterers or boat repairers.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices as marine painter/refinisher, marine carpenter, marine mechanical systems technician or marine welder/fabricator. A program may be structured to emphasize one of the course areas but does not have to cover all areas comprehensively.

8751310	Basic Boat and Yacht Repair/Refinishing 1
8751320	Basic Boat and Yacht Repair/Refinishing 2
8751330	Basic Boat and Yacht Repair/Refinishing 3
8751340	Basic Boat and Yacht Repair/Refinishing 4
8751350	Basic Boat and Yacht Repair/Refinishing 5
8751360	Basic Boat and Yacht Repair/Refinishing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in manufacturing, fabrication, repair, painting and refinishing in a boatyard manufacturing or refurbishing environment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Distinguish the different types of marine manufacturing industries.
02. Describe the different types of marine trades and occupations.
03. Demonstrate proficiency in preparing surfaces and applying marine paint finishes.
04. Demonstrate proficiency in preparing surfaces and refinishing fiberglass.
05. Demonstrate proficiency in marine terminology.
06. Demonstrate proficiency in safety practices in marine occupations.
07. Demonstrate the ability to properly handle lines and related operations in securing a vessel.
08. Demonstrate proficiency in coordinating the manufacturing, repair and refinishing operations in the marine industry.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8751300

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing POSTSECONDARY NUMBER:

01.0 DISTINGUISH THE DIFFERENT TYPES OF MARINE MANUFACTURING INDUSTRIES--The student will be able to:

01.01 Explain the process of manufacturing motor yachts.
01.02 Explain the process of manufacturing sail boats.
01.03 Explain the process of manufacturing small power boats.
01.04 Explain the process of manufacturing center console boats.
01.05 Explain the process of manufacturing of commercial work boats.

02.0 DESCRIBE THE DIFFERENT TYPES OF MARINE TRADES AND OCCUPATIONS--The student will be able to:

02.01 Describe the occupational requirements of a boat finisher/painter.
02.02 Describe the occupational requirements of a marine carpenter.
02.03 Describe the occupational requirements of a marine mechanical installer.
02.04 Describe the occupational requirements of a marine welder fabricator.

03.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND APPLYING MARINE PAINT FINISHES--The student will be able to:

03.01 Prepare wood surfaces for painting.
03.02 Prepare aluminum surfaces for painting.
03.03 Prepare steel surfaces for painting.
03.04 Apply paint to surfaces by brush.
03.05 Apply paint to surfaces by spray gun.

04.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND REFINISHING FIBERGLASS--The student will be able to:

04.01 Prepare raw fiberglass surfaces for painting.
04.02 Repair and refinish fiberglass surfaces.

05.0 DEMONSTRATE PROFICIENCY IN MARINE TERMINOLOGY--The student will be able to:

05.01 Use correct marine terminology.
05.02 Use correct marine technical terminology.

06.0 DEMONSTRATE PROFICIENCY IN SAFETY PRACTICES IN MARINE OCCUPATIONS--The student will be able to:

06.01 Demonstrate the safe use of hand tools in marine occupations.
06.02 Demonstrate the safe use of power tools in marine occupations.
06.03 Demonstrate the safe use of paints, chemicals, fiberglass and compounds.
06.04 Demonstrate the safe use of electrical connectors, cords and tools.
06.05 Apply shop safety rules.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY HANDLE LINES AND RELATED OPERATIONS IN SECURING A VESSEL--The student will be able to:

07.01 Identify the correct nautical knots used in securing a vessel.
07.02 Identify the current terminology of lines.
07.03 Demonstrate slowing a vessel in dock.
07.04 Place fenderboards to protect a vessel
07.05 Connect ancillary services to a moored vessel.

08.0 DEMONSTRATE PROFICIENCY IN COORDINATING THE MANUFACTURING, REPAIR AND REFINISHING OPERATIONS IN THE MARINE INDUSTRY.--The student will be able to:

08.01 Identify the different types of work processes.
08.02 Identify the sequential order of work processes.
08.03 Demonstrate the ability to coordinate the work processes in the boatyard manufacturing or refurbishing environment.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.

12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing PROGRAM NUMBER: 8751300

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing 1 COURSE NUMBER: 8751310

COURSE DESCRIPTION:

The purpose of this course is to orient the student to aspects of the marine manufacturing industry, related occupations. Also, content includes safety, marine terminology, and related math and language skills.

01.0 DISTINGUISH THE DIFFERENT TYPES OF MARINE MANUFACTURING INDUSTRIES--The student will be able to:

- 01.01 Explain the process of manufacturing motor yachts.
- 01.02 Explain the process of manufacturing sail boats.
- 01.03 Explain the process of manufacturing small power boats.
- 01.04 Explain the process of manufacturing center console boats.
- 01.05 Explain the process of manufacturing of commercial work boats.

02.0 DESCRIBE THE DIFFERENT TYPES OF MARINE TRADES AND OCCUPATIONS--The student will be able to:

- 02.01 Describe the occupational requirements of a boat finisher/painter.
- 02.02 Describe the occupational requirements of a marine carpenter.
- 02.03 Describe the occupational requirements of a marine mechanical installer.
- 02.04 Describe the occupational requirements of a marine welder fabricator.

05.0 DEMONSTRATE PROFICIENCY IN MARINE TERMINOLOGY--The student will be able to:

- 05.01 Use correct marine terminology.
- 05.02 Use correct marine technical terminology.

06.0 DEMONSTRATE PROFICIENCY IN SAFETY PRACTICES IN MARINE OCCUPATIONS.--The student will be able to:

- 06.01 Demonstrate the safe use of hand tools in marine occupations.
- 06.02 Demonstrate the safe use of power tools in marine occupations.
- 06.03 Demonstrate the safe use of paints, chemicals, fiberglass and compounds.
- 06.04 Demonstrate the safe use of electrical connectors, cords and tools.
- 06.05 Apply shop safety rules.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 09.02 Read and understand graphs, charts, diagrams, and tables commonly

used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Boat and Yacht Repair/Refinishing	PROGRAM NUMBER:	8751300
PROGRAM TITLE:	Basic Boat and Yacht Repair/Refinishing 2	COURSE NUMBER:	8751320

COURSE DESCRIPTION:

The purpose of this course is to provide training in handling lines and securing a vessel in dock for repair.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY HANDLE LINES AND RELATED OPERATIONS IN SECURING A VESSEL--The student will be able to:

07.01 Identify the correct nautical knots used in securing a vessel.
07.02 Identify the current terminology of lines.
07.03 Demonstrate slowing a vessel in dock.
07.04 Place fenderboards to protect a vessel
07.05 Connect ancillary services to a moored vessel.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Boat and Yacht Repair/Refinishing	PROGRAM NUMBER:	8751300
PROGRAM TITLE:	Basic Boat and Yacht Repair/Refinishing 3	COURSE NUMBER:	8751330

COURSE DESCRIPTION:

The purpose of this course is to provide training in skills related to preparation and painting of marine finishes on wood, aluminum, and steel boats and yachts.

03.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND APPLYING MARINE PAINT FINISHES--The student will be able to:

03.01 Prepare wood surfaces for painting.
03.02 Prepare aluminum surfaces for painting.
03.03 Prepare steel surfaces for painting.
03.04 Apply paint to surfaces by brush.
03.05 Apply paint to surfaces by spray gun.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing — PROGRAM NUMBER: 8751300

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing 4 — COURSE NUMBER: 8751340

COURSE DESCRIPTION:

The purpose of this course is to provide training in skills related to preparing surfacers and refinishing fiberglass.

04.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND REFINISHING FIBERGLASS--The student will be able to:

04.01 Prepare raw fiberglass surfaces for painting.
04.02 Repair and refinish fiberglass surfaces.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing — PROGRAM NUMBER: 8751300

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing 5 — COURSE NUMBER: 8751350

COURSE DESCRIPTION:

The purpose of this course is provide training in entrepreneurship skills.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

08.0 DEMONSTRATE PROFICIENCY IN COORDINATING THE MANUFACTURING, REPAIR AND REFINISHING OPERATIONS IN THE MARINE INDUSTRY.--The student will be able to:

08.01 Identify the different types of work processes.
08.02 Identify the sequential order of work processes.
08.03 Demonstrate the ability to coordinate the work processes in the boatyard manufacturing or refurbishing environment.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing

PROGRAM NUMBER: 8751300

PROGRAM TITLE: Basic Boat and Yacht Repair/Refinishing 6

COURSE NUMBER: 8751360

COURSE DESCRIPTION:

The purpose of this course is to provide training in employability skills.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated

CODE NUMBER: Secondary 8721000 Postsecondary ___

Florida CIP 0648.079902

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: CAB WOODWK @ 7 G CARPENTRY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as shipfitters (89121678), or boat builders (860.381-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of fiberglass and marine woodworking skills, frame building, painting and installation of hardware and simple electrical and mechanical systems. A program may be structured to emphasize either wood or fabricated boatbuilding but does not have to cover both areas comprehensively.

Listed below are the courses that comprise this program when offered at the secondary level:

8721010	Basic Boatbuilding - Wood and Fabricated 1
8721020	Basic Boatbuilding - Wood and Fabricated 2
8721030	Basic Boatbuilding - Wood and Fabricated 3
8721040	Basic Boatbuilding - Wood and Fabricated 4
8721050	Basic Boatbuilding - Wood and Fabricated 5
8721060	Basic Boatbuilding - Wood and Fabricated 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in fiberglass lamination and fabrication, gelcoat repair, boat woodworking operations, painting and servicing basic systems in a boatyard manufacturing or refurbishing environment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply trade accepted terminology and safety.
02. Perform hand lamination operations.
03. Repair gelcoat.
04. Perform framing operations.
05. Perform trim operations.
06. Install and service mechanical systems.
07. Install wiring systems.
08. Perform fiberglass fabrication operations.
09. Perform assembly woodworking operations.
10. Construct molds.
11. Repair fiberglass.
12. Apply paint.
13. Repair wooden boats.
14. Service piping/wiring systems.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8721000

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated POSTSECONDARY NUMBER:

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Use work schedule and progress chart.
01.03 Use marine and technical terminology.
01.04 Apply shop safety rules.

02.0 PERFORM HAND LAMINATION OPERATIONS--The student will be able to:

02.01 Identify tools, materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

03.0 REPAIR GELCOAT--The student will be able to:

03.01 Identify tools, materials and precautions.
03.02 Sand and buff gelcoat.
03.03 Repair gelcoat with putty.
03.04 Repair gelcoat with spray equipment.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 INSTALL AND SERVICE MECHANICAL SYSTEMS--The student will be able to:

06.01 Identify tools and precautions.
06.02 Perform routine engine service.
06.03 Maintain mechanical steering.
06.04 Repair rigging.
06.05 Install deck hardware.

07.0 INSTALL WIRING SYSTEMS--The student will be able to:

07.01 Identify tools, materials and precautions.
07.02 Install batteries.
07.03 Select DC conductor size.
07.04 Install DC lighting.

08.0 PERFORM FIBERGLASS FABRICATION OPERATIONS--The student will be able to:

08.01 Operate chop gun.
08.02 Prepare and apply bonding putty.
08.03 Identify and apply core materials.
08.04 Fabricate parts by vacuum molding.
08.05 Prepare mold for gelcoat.
08.06 Operate gel gun.
08.07 Pull parts.
08.08 Repair molds.
08.09 Maintain molds.

09.0 PERFORM ASSEMBLY WOODWORKING OPERATIONS--The student will be able to:

09.01 Level hull and set up cross beams.
09.02 Fabricate and install sub-sole components.
09.03 Fabricate and install sole.
09.04 Construct router, shaper, and tracing patterns.
09.05 Cut bulkheads from patterns.
09.06 Construct straight moldings and posts.
09.07 Construct turn corner moldings and posts.
09.08 Construct solid and laminated curved moldings.

10.0 CONSTRUCT MOLDS--The student will be able to:

10.01 Prepare plug for mold lamination.
10.02 Gel and skin mold.
10.03 Laminate mold.
10.04 Brace and pull mold.
10.05 Prepare mold for the first use.

11.0 REPAIR FIBERGLASS--The student will be able to:

11.01 Install point loads and stiffeners.
11.02 Repair laminates.
11.03 Renew bottom paint.

12.0 APPLY PAINT--The student will be able to:

12.01 Identify materials and precautions.
12.02 Repair/prepare surface.
12.03 Apply and prepare primer.
12.04 Apply masking and pull tapes.
12.05 Apply paint with spray equipment.

13.0 REPAIR WOODEN BOATS--The student will be able to:

13.01 Identify wooden boat construction type.
13.02 Repair plank-on-frames construction.
13.03 Use epoxy resin in restoration/repair.
13.04 Maintain wooden boats.

14.0 SERVICE PIPING/WIRING SYSTEMS--The student will be able to:

14.01 Maintain fuel systems.
14.02 Maintain sewage systems.
14.03 Troubleshoot DC systems.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to

accurately fill out forms/invoices commonly used in business and industry.

15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business

efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated — PROGRAM NUMBER: 8721000

COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 1 — COURSE NUMBER: 8721010

COURSE DESCRIPTION:

This course is designed to provide an introduction of the related trade terminology, safety rules and regulation, communication and human relation skills.

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Use work schedule and progress chart.
01.03 Use marine and technical terminology.
01.04 Apply shop safety rules.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Boatbuilding - Wood and Fabricated	PROGRAM NUMBER:	8721000
COURSE TITLE:	Basic Boatbuilding - Wood and Fabricated 2	COURSE NUMBER:	8721020

COURSE DESCRIPTION:

This course is designed to provide instruction in hand laminating framing and assembling wood working operations.

02.0 PERFORM HAND LAMINATION OPERATIONS--The student will be able to:

02.01 Identify tools, materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

09.0 PERFORM ASSEMBLY WOODWORKING OPERATIONS--The student will be able to:

09.01 Level hull and set up cross beams.
09.02 Fabricate and install sub-sole components.
09.03 Fabricate and install sole.
09.04 Construct router, shaper, and tracing patterns.
09.05 Cut bulkheads from patterns.
09.06 Construct straight moldings and posts.
09.07 Construct turn corner moldings and posts.
09.08 Construct solid and laminated curved moldings.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Boatbuilding - Wood and Fabricated	PROGRAM NUMBER:	8721000
COURSE TITLE:	Basic Boatbuilding - Wood and Fabricated 3	COURSE NUMBER:	8721030

COURSE DESCRIPTION:

This course is designed to provide instruction in the techniques of constructing and using a mold for fiberglass fabrication.

08.0 PERFORM FIBERGLASS FABRICATION OPERATIONS--The student will be able to:

08.01 Operate chop gun.

08.02 Prepare and apply bonding putty.
08.03 Identify and apply core materials.
08.04 Fabricate parts by vacuum molding.
08.05 Prepare mold for gelcoat.
08.06 Operate gel gun.
08.07 Pull parts.
08.08 Repair molds.
08.09 Maintain molds.

10.0 CONSTRUCT MOLDS--The student will be able to:

10.01 Prepare plug for mold lamination.
10.02 Gel and skin mold.
10.03 Laminate mold.
10.04 Brace and pull mold.
10.05 Prepare mold for the first use.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Boatbuilding - Wood and Fabricated	PROGRAM NUMBER:	8721000
COURSE TITLE:	Basic Boatbuilding - Wood and Fabricated 4	COURSE NUMBER:	8721040

COURSE DESCRIPTION:

This course is designed to provide instruction in the application of trims, and required hardware, pointing application and the servicing of the mechanical system.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 INSTALL AND SERVICE MECHANICAL SYSTEMS--The student will be able to:

06.01 Identify tools and precautions.
06.02 Perform routine engine service.
06.03 Maintain mechanical steering.
06.04 Repair rigging.
06.05 Install deck hardware.

12.0 APPLY PAINT--The student will be able to:

12.01 Identify materials and precautions.
12.02 Repair/prepare surface.
12.03 Apply and prepare primer.
12.04 Apply masking and pull tapes.
12.05 Apply paint with spray equipment.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated | PROGRAM NUMBER: 8721000

COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 5 | COURSE NUMBER: 8721050

COURSE DESCRIPTION:

This course is designed to provide instruction in the installation of the wiring and piping systems of boatbuilding and repairing.

07.0 INSTALL WIRING SYSTEMS--The student will be able to:

07.01 Identify tools, materials and precautions.
07.02 Install batteries.
07.03 Select DC conductor size.
07.04 Install DC lighting.

14.0 SERVICE PIPING/WIRING SYSTEMS--The student will be able to:

14.01 Maintain fuel systems.
14.02 Maintain sewage systems.
14.03 Troubleshoot DC systems.

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STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated | PROGRAM NUMBER: 8721000

COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 6 | COURSE NUMBER: 8721060

COURSE DESCRIPTION:

This course is designed to provide instruction in the tools, methods and techniques of boat maintenance repairing of gelcoat, fiberglass wood and metal boat repair.

03.0 REPAIR GELCOAT--The student will be able to:

03.01 Identify tools, materials and precautions.
03.02 Sand and buff gelcoat.
03.03 Repair gelcoat with putty.
03.04 Repair gelcoat with spray equipment.

11.0 REPAIR FIBERGLASS--The student will be able to:

11.01 Install point loads and stiffeners.
11.02 Repair laminates.
11.03 Renew bottom paint.

13.0 REPAIR WOODEN BOATS--The student will be able to:

13.01 Identify wooden boat construction type.
13.02 Repair plank-on-frames construction.
13.03 Use epoxy resin in restoration/repair.
13.04 Maintain wooden boats.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Cabinetmaking and Millwork

CODE NUMBER: Secondary 8721100 Postsecondary _______

Florida CIP 0648.072300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 x 9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: CAB WOODWK @ 7 G CARPENTRY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as woodworking machine operators (92314816), cabinetmaker apprentices (660.280-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: instruction in using hand tools; operating portable power tools and stationary power woodworking machines; planning, designing and layout of cabinets and casework; constructing and assembling cabinet components; constructing joints; fastening stock and joints; constructing and installing cabinet drawers and doors; applying laminates; finishing surfaces; and basic safety rules and procedures.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8721110	Basic Cabinetmaking and Millwork 1
8721120	Basic Cabinetmaking and Millwork 2
8721130	Basic Cabinetmaking and Millwork 3
8721140	Basic Cabinetmaking and Millwork 4
8721150	Basic Cabinetmaking and Millwork 5
8721160	Basic Cabinetmaking and Millwork 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: table saws, radial arm saws, jointers and planers, band saws, routers and shapers, belt sanders, drills and drill presses, portable power hand tools and hand tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer

which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in applying safety rules and procedures.
02. Demonstrate proficiency using hand tools.
03. Demonstrate proficiency operating portable power tools.
04. Demonstrate proficiency operating stationary power woodworking machines.
05. Demonstrate proficiency in planning, designing and layout of cabinets and casework.
06. Demonstrate proficiency in constructing and assembling cabinet components.
07. Demonstrate proficiency in constructing joints.
08. Demonstrate ability to fasten stock and joints.
09. Demonstrate proficiency in constructing and installing cabinet drawers and doors.
10. Demonstrate proficiency in applying laminates.
11. Demonstrate ability to finish surfaces.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8721100

PROGRAM TITLE: Basic Cabinetmaking and Millwork POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN APPLYING SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Apply personal safety rules and procedures.
01.03 Apply fire safety rules and procedures.
01.04 Apply electrical safety rules and procedures.
01.05 Apply material safety data sheet information.
01.06 Apply chemical safety rules and procedures.

02.0 DEMONSTRATE PROFICIENCY USING HAND TOOLS--The student will be able to:

02.01 Identify types and uses of files and rasps.
02.02 Lay out angles with squares.
02.03 Gauge lines parallel to an edge with fingers, rules and squares.
02.04 Make cross cuts and rip cuts using hand saws.
02.05 Cut stock at an angle using a miter box.
02.06 Cut stock with a coping saw, back saw and keyhole saw.
02.07 Cut metal using a hacksaw.
02.08 Divide a distance into equal spaces using a divider.
02.09 Scribe and fit edges of stock to an irregular surface.
02.10 Sharpen drill bits and wood chisels.
02.11 Drill holes with hand drills.
02.12 Drive and set nails and screws.
02.13 Sharpen planes and cabinet scrapers.
02.14 Smooth wood surfaces using planes and cabinet scrapers.
02.15 Measure stock using rulers and tape measures.
02.16 Use a wood chisel to notch or mortise stock.

03.0 DEMONSTRATE PROFICIENCY OPERATING PORTABLE POWER TOOLS--The student will be able to:

03.01 Utilize a circular saw to make straight, beveled and compound angle cuts.
03.02 Utilize a saber saw to make straight, beveled and compound angle cuts.
03.03 Utilize a portable drill to bore holes to specified depths.
03.04 Drive screws using a power screwdriver or screw gun.
03.05 Utilize a power plane to smooth a straight edge.
03.06 Utilize a router to shape edges and cut a groove, dado and rabbet.
03.07 Sand surfaces with a belt sander and a finishing sander.
03.08 Fasten material with a pneumatic stapler or nailer.
03.09 Fasten a butt joint with a pneumatic corrugated fastening tool.

04.0 DEMONSTRATE PROFICIENCY OPERATING STATIONARY POWER WOODWORKING MACHINES--The student will be able to:

04.01 Use a table saw to make cross, rip, miter, dado and groove cuts.
04.02 Use a radial arm saw to make cross, rip, miter, compound angle, dado and groove cuts.
04.03 Use a drill press to drill, counterbore and countersink holes in stock and bore holes at an angle.
04.04 Use a jointer to square, bevel or chamfer stock.
04.05 Use a plane to trim stock to a specified thickness.
04.06 Use a band saw to make straight, curved, rectangular and freehand

cuts.
04.07 Remove and replace band saw blades and adjust guides.
04.08 Use a router to cut stock with and without a template.
04.09 Use a shaper to mold stock with a template, fence, miter gage or pin and bearing.
04.10 Use a power miter saw to make miter cuts.
04.11 Sand surfaces using power belt, disc and spindle sanders.

05.0 DEMONSTRATE PROFICIENCY IN PLANNING, DESIGNING AND LAYOUT OF CABINETS AND CASEWORK--The student will be able to:

05.01 Convert measurements in inches to metric and metric to inches.
05.02 Interpret blueprints and explain common abbreviations used on drawings.
05.03 Draw plans to scale using an architect's ruler.
05.04 Lay out a rectangle, hexagon, octagon, ellipse and circle.
05.05 Lay out angles.
05.06 Select and match wood stock for compatibility of grain and color.
05.07 Develop sketching skills.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND ASSEMBLING CABINET COMPONENTS--The student will be able:

06.01 Lay out and cut cabinet components from solid wood, plywood and particle board.
06.02 Lay out and cut joints in cabinet components.
06.03 Assemble and fasten cabinet base frame.
06.04 Assemble and fasten cabinet sides, back and front.
06.05 Prepare cabinet components for special fittings.
06.06 Cut and assemble cabinet shelving.
06.07 Assemble and fasten cabinet top.
06.08 Lay out and cut back splash components.

07.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING JOINTS--The student will be able to:

07.01 Construct a butt joint.
07.02 Construct a doweled butt joint.
07.03 Construct a dado joint.
07.04 Construct a rabbeted joint.
07.05 Construct a lap joint.
07.06 Construct a miter joint.
07.07 Install dowels in common wood joints.
07.08 Construct a tongue and groove joint.
07.09 Construct a splined edge joint.
07.10 Construct a mortise and tenon joint.
07.11 Construct a dovetail joint.
07.12 Construct an end lap joint.
07.13 Construct a middle lap joint.
07.14 Construct a cross lap joint.
07.15 Construct a dovetail lap joint.
07.16 Construct a draw bolt joint.

08.0 DEMONSTRATE ABILITY TO FASTEN STOCK AND JOINTS--The student will be able to:

08.01 Identify types of glues and describe their applications.
08.02 Fasten stock with wood glue and clamps.
08.03 Glue boards edge to edge.
08.04 Fasten and glue mitered frames.
08.05 Fasten and glue doweled joints and segments.
08.06 Fasten stock and joints with nails, screws, bolts and staples.

08.07 Fill and finish nail and screw holes.
08.08 Install wood plugs in prepared holes.
08.09 Install and glue corner blocks.

09.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND INSTALLING CABINET DRAWERS AND DOORS--The student will be able to:

09.01 Construct an overlay drawer.
09.02 Construct a lipped drawer.
09.03 Construct a flush drawer.
09.04 Install drawer guides.
09.05 Install drawer hardware.
09.06 Construct solid, panel and tambour doors.

10.0 DEMONSTRATE PROFICIENCY IN APPLYING LAMINATES--The student will be able to:
10.01 Cut laminates to rough size of cabinet surface.
10.02 Apply glue to laminate and cabinet surfaces.
10.03 Accurately place laminate on cabinet surfaces.
10.04 Press and smooth laminate on cabinet surfaces.
10.05 Trim off excess laminate and file edges.
10.06 Seam two pieces of laminate together.
10.07 Remove excess glue from laminate surfaces.

11.0 DEMONSTRATE ABILITY TO FINISH SURFACES--The student will be able to:

11.01 Sand wood surfaces for finishing.
11.02 Stain, bleach, fill and seal wood surfaces.
11.03 Apply clear and pigmented finishes using a brush.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking and Millwork | PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking and Millwork 1 | COURSE NUMBER: 8721110

COURSE DESCRIPTION:

This course is designed to provide instruction in the correct use of hand tools by completing correlated projects.

01.0 DEMONSTRATE PROFICIENCY IN APPLYING SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Apply personal safety rules and procedures.
01.03 Apply fire safety rules and procedures.
01.04 Apply electrical safety rules and procedures.
01.05 Apply material safety data sheet information.
01.06 Apply chemical safety rules and procedures.

02.0 DEMONSTRATE PROFICIENCY USING HAND TOOLS--The student will be able to:

02.01 Identify types and uses of files and rasps.
02.02 Lay out angles with squares.
02.03 Gauge lines parallel to an edge with fingers, rules and squares.
02.04 Make cross cuts and rip cuts using hand saws.
02.05 Cut stock at an angle using a miter box.
02.06 Cut stock with a coping saw, back saw and keyhole saw.
02.07 Cut metal using a hacksaw.
02.08 Divide a distance into equal spaces using a divider.
02.09 Scribe and fit edges of stock to an irregular surface.
02.10 Sharpen drill bits and wood chisels.
02.11 Drill holes with hand drills.
02.12 Drive and set nails and screws.
02.13 Sharpen planes and cabinet scrapers.
02.14 Smooth wood surfaces using planes and cabinet scrapers.
02.15 Measure stock using rulers and tape measures.
02.16 Use a wood chisel to notch or mortise stock.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking and Millwork | PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking and Millwork 2 | COURSE NUMBER: 8721120

COURSE DESCRIPTION:

This course is designed to provide instruction in the correct use of portable power tools by completing correlated projects.

03.0 DEMONSTRATE PROFICIENCY OPERATING PORTABLE POWER TOOLS--The student will

07.10 Construct a mortise and tenon joint.
07.11 Construct a dovetail joint.
07.12 Construct an end lap joint.
07.13 Construct a middle lap joint.
07.14 Construct a cross lap joint.
07.15 Construct a dovetail lap joint.
07.16 Construct a draw bolt joint.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking and Millwork PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking and Millwork 4 COURSE NUMBER: 8721140

COURSE DESCRIPTION:

This course is designed to provide instruction in the fastening of stock and joints and in planning, designing and layout of cabinets and casework.

05.0 DEMONSTRATE PROFICIENCY IN PLANNING, DESIGNING AND LAYOUT OF CABINETS AND CASEWORK--The student will be able to:

05.01 Convert measurements in inches to metric and metric to inches.
05.02 Interpret blueprints and explain common abbreviations used on drawings.
05.03 Draw plans to scale using an architect's ruler.
05.04 Lay out a rectangle, hexagon, octagon, ellipse and circle.
05.05 Lay out angles.
05.06 Select and match wood stock for compatibility of grain and color.
05.07 Develop sketching skills.

08.0 DEMONSTRATE ABILITY TO FASTEN STOCK AND JOINTS--The student will be able to:

08.01 Identify types of glues and describe their applications.
08.02 Fasten stock with wood glue and clamps.
08.03 Glue boards edge to edge.
08.04 Fasten and glue mitered frames.
08.05 Fasten and glue doweled joints and segments.
08.06 Fasten stock and joints with nails, screws, bolts and staples.
08.07 Fill and finish nail and screw holes.
08.08 Install wood plugs in prepared holes.
08.09 Install and glue corner blocks.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking and Millwork PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking and Millwork 5 COURSE NUMBER: 8721150

COURSE DESCRIPTION:

This course is designed to provide instruction in the construction, assembly and installation of cabinet components.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND ASSEMBLING CABINET COMPONENTS--The student will be able:

06.01 Lay out and cut cabinet components from solid wood, plywood and particle board.
06.02 Lay out and cut joints in cabinet components.
06.03 Assemble and fasten cabinet base frame.
06.04 Assemble and fasten cabinet sides, back and front.
06.05 Prepare cabinet components for special fittings.
06.06 Cut and assemble cabinet shelving.
06.07 Assemble and fasten cabinet top.
06.08 Lay out and cut back splash components.

09.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND INSTALLING CABINET DRAWERS AND DOORS--The student will be able to:

09.01 Construct an overlay drawer.
09.02 Construct a lipped drawer.
09.03 Construct a flush drawer.
09.04 Install drawer guides.
09.05 Install drawer hardware.
09.06 Construct solid, panel and tambour doors.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Cabinetmaking and Millwork	PROGRAM NUMBER:	8721100
COURSE TITLE:	Basic Cabinetmaking and Millwork 6	COURSE NUMBER:	8721160

COURSE DESCRIPTION:

This course is designed to provide instruction in applying laminates, finishing surfaces and employability skills.

10.0 DEMONSTRATE PROFICIENCY IN APPLYING LAMINATES--The student will be able to:

10.01 Cut laminates to rough size of cabinet surface.
10.02 Apply glue to laminate and cabinet surfaces.
10.03 Accurately place laminate on cabinet surfaces.
10.04 Press and smooth laminate on cabinet surfaces.
10.05 Trim off excess laminate and file edges.
10.06 Seam two pieces of laminate together.
10.07 Remove excess glue from laminate surfaces.

11.0 DEMONSTRATE ABILITY TO FINISH SURFACES--The student will be able to:

11.01 Sand wood surfaces for finishing.
11.02 Stain, bleach, fill and seal wood surfaces.
11.03 Apply clear and pigmented finishes using a brush.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able

to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful

entrepreneur.

16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Commercial Art

CODE NUMBER: Secondary 8718000 Postsecondary ____________

Florida CIP 0648.022300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 x 9-12 _____Postsecondary Adult Vocational

_____Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMM ART @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as commercial artists and related workers (34035178). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: graphic production, technical art skills, design skills, lettering skills, typography layout and paste-up skills, illustration skills, applied design, air brush skills, and desk-top publishing skills.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8718010	Basic Commercial Art 1
8718020	Basic Commercial Art 2
8718030	Basic Commercial Art 3
8718040	Basic Commercial Art 4
8718050	Basic Commercial Art 5
8718060	Basic Commercial Art 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment and supplies; paste-ups and mechanicals; typography, lettering, layout, illustration and if equipment is available and time allows photography, development of air brush skills, computer graphics, and desk-top publishing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-

job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in graphic production skills.
02. Demonstrate proficiency in technical art skills.
03. Demonstrate proficiency in design skills.
04. Demonstrate proficiency in lettering skills.
05. Demonstrate proficiency in typography skills.
06. Demonstrate proficiency in layout and paste-up skills.
07. Demonstrate proficiency in illustration skills.
08. Demonstrate proficiency in applied design skills.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.
14. Demonstrate proficiency in performing computerized creative support operations.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8718000
PROGRAM TITLE: Basic Commercial Art
POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

01.01 Define the differences in production processes and estimate relative costs.
01.02 Recognize limitations for printing.
01.03 Identify and select different printing surfaces.
01.04 Identify and select appropriate printing inks.
01.05 Identify and select finishing processes.

02.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

02.01 Explain care and respect for all tools and equipment.
02.02 Make computations for centering, spacing and scaling drawings.
02.03 Draw on various types of drafting media.
02.04 Interpret information from drawings, prints and sketches.
02.05 Draw freehand sketches.
02.06 Draw auxiliary views.
02.07 Draw a one and two-point perspective.
02.08 Make corrections on a drawing.
02.09 Draw in ink on a variety of surfaces.
02.10 Develop a glossary of technical terms.

03.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

03.01 Explain proper use and care of tools.
03.02 Apply principles and elements of design.
03.03 Apply color theory (pigment versus light).
03.04 Utilize tones, hues and values.
03.05 Sketch designs using pencil and ink.
03.06 Paint freehand or within sketched designs using mixed colors or apply colors to produce desired shades.
03.07 Apply color for impact (color psychology).
03.08 Differentiate between line halftone, duotone and four-color process.
03.09 Demonstrate balance in design.
03.10 Demonstrate designs with symmetry and asymmetry.
03.11 Develop grids for layouts of magazine pages, ads, etc.

04.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to:

04.01 Demonstrate use and care of tools, lettering pens, t-squares and triangles.
04.02 Identify and select lettering styles.
04.03 Perform and use pen, brush, pencil and LeRoy lettering.
04.04 Utilize guidelines, margins and spacing for layouts.
04.05 Paint or draw precise lettering for reproduction.
04.06 Utilize various types of prepared lettering processes.
04.07 Produce a sign on poster board.
04.08 Determine and select lettering styles for layout sketches.
04.09 Illuminate a certificate.

05.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

05.01 Explain proper use, care and cleaning of equipment.
05.02 Identify and select typography materials.
05.03 Define typographic terms, including leading and kerning.
05.04 Identify and select typographic methods.
05.05 Demonstrate the ability to proofread and use proofreaders' marks.
05.06 Explain picas, points and conversion to inches.
05.07 Explain specification of type and copy fitting.

06.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--The student will be able to:

06.01 Explain proper use and care of tools.
06.02 Identify parts of a layout.
06.03 Utilize amberlith, rubylith, screens, overlays and register marks.
06.04 Make thumbnail sketch pencil layouts.
06.05 Prepare comprehensives from pencil layouts.
06.06 Prepare camera-ready mechanicals from comprehensives.
06.07 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
06.08 Crop and scale artwork and/or photos for layouts.
06.09 Demonstrate enlarging or reducing with a grid, proportion wheel and other methods.
06.10 Make a color separation with overlays.
06.11 Demonstrate various ruling techniques.
06.12 Demonstrate various ruling techniques.
06.13 Specify the use of halftones or special effects.

07.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

07.01 Explain proper use and care of tools.
07.02 Demonstrate elementary anatomy drawing skills.
07.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor and paints.
07.04 Demonstrate renderings of different textures using the above media.
07.05 Make illustrations using various subjects.

08.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

08.01 Locate and identify resource materials and develop a morgue.
08.02 Design logos.
08.03 Design stationery layouts.
08.04 Design a magazine/book cover or record jacket.
08.05 Design an ad campaign that includes newspapers, magazines and billboards.
08.06 Design a greeting card.
08.07 Design a business card.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify and adopt acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

14.0 DEMONSTRATE PROFICIENCY IN PERFORMING COMPUTERIZED CREATIVE SUPPORT OPERATIONS.

14.01 Prepare desk-top publishing equipment for operations.
14.02 Operate desk-top publishing equipment.
14.03 Proofread desk-top copy.
14.04 Modify existing copy utilizing desk-top publishing equipment.
14.05 Prepare multiple-page copy utilizing desk-top publishing equipment.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Basic Commercial Art
COURSE TITLE: Basic Commercial Art 1

EFFECTIVE DATE: July, 1993
COURSE CREDIT: 1
PROGRAM NUMBER: 8718000
COURSE NUMBER: 8718010

COURSE DESCRIPTION:

This course is designed to provide instruction in communication skills and graphic production processes.

01.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

01.01 Define the differences in production processes and estimate relative costs.
01.02 Recognize limitations for printing.
01.03 Identify and select different printing surfaces.
01.04 Identify and select appropriate printing inks.
01.05 Identify and select finishing processes.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Basic Commercial Art
COURSE TITLE: Basic Commercial Art 2

EFFECTIVE DATE: July, 1993
COURSE CREDIT: 1
PROGRAM NUMBER: 8718000
COURSE NUMBER: 8718020

COURSE DESCRIPTION:

This course is designed to provide instruction in technical art and design skills.

02.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

02.01 Explain care and respect for all tools and equipment.
02.02 Make computations for centering, spacing and scaling drawings.
02.03 Draw on various types of drafting media.
02.04 Interpret information from drawings, prints and sketches.
02.05 Draw freehand sketches.
02.06 Draw auxiliary views.
02.07 Draw a one- and two-point perspective.
02.08 Make corrections on a drawing.
02.09 Draw in ink on a variety or surfaces.
02.10 Develop a glossary of technical terms.

03.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

03.01 Explain proper use and care of tools.
03.02 Apply principles and elements of design.
03.03 Apply color theory (pigment versus light).
03.04 Utilize tones, hues and values.
03.05 Sketch designs using pencil and ink.
03.06 Paint freehand or within sketched designs using mixed colors or apply colors to produce desired shades.
03.07 Apply color for impact (color psychology).
03.08 Differentiate between line halftone, duotone and four-color process.
03.09 Demonstrate balance in design.
03.10 Demonstrate designs with symmetry and asymmetry.
03.11 Develop grids for layouts of magazine pages, ads, etc.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Art

PROGRAM NUMBER: 8718000

COURSE TITLE: Basic Commercial Art 3

COURSE NUMBER: 8718030

COURSE DESCRIPTION:

This course is designed to provide instruction in lettering skills and typography techniques.

04.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to:

04.01 Demonstrate use and care of tools, lettering pens, t-squares and triangles.
04.02 Identify and select lettering styles.
04.03 Perform and use pen, brush, pencil and LeRoy lettering.
04.04 Utilize guidelines, margins and spacing for layouts.
04.05 Paint or draw precise lettering for reproduction.
04.06 Utilize various types of prepared lettering processes.
04.07 Produce a sign on poster board.
04.08 Determine and select lettering styles for layout sketches.
04.09 Illuminate a certificate.

05.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

05.01 Explain proper use, care and cleaning of equipment.
05.02 Identify and select typography materials.
05.03 Define typographic terms, including leading and kerning.
05.04 Identify and select typographic methods.
05.05 Demonstrate the ability to proofread and use proofreaders' marks.
05.06 Explain picas, points and conversion to inches.
05.07 Explain specification of type and copy fitting.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Art

PROGRAM NUMBER: 8718000

COURSE TITLE: Basic Commercial Art 4

COURSE NUMBER: 8718040

COURSE DESCRIPTION:

This course is designed to provide instruction in layout and paste-up techniques and illustration skills.

06.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--The student will be able to:

06.01 Explain proper use and care of tools.
06.02 Identify parts of a layout.
06.03 Utilize amberlith, rubylith, screens, overlays and register marks.
06.04 Make thumbnail sketch pencil layouts.
06.05 Prepare comprehensives from pencil layouts.

06.06 Prepare camera-ready mechanicals from comprehensives.
06.07 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
06.08 Crop and scale artwork and/or photos for layouts.
06.09 Demonstrate enlarging or reducing with a grid, proportion wheel and other methods.
06.10 Make a color separation with overlays.
06.11 Demonstrate various ruling techniques.
06.12 Demonstrate various ruling techniques.
06.13 Specify the use of halftones or special effects.

07.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

07.01 Explain proper use and care of tools.
07.02 Demonstrate elementary anatomy drawing skills.
07.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor and paints.
07.04 Demonstrate renderings of different textures using the above media.
07.05 Make illustrations using various subjects.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 5
COURSE NUMBER: 8718050

COURSE DESCRIPTION:

This course is designed to provide instruction in applied design techniques.

08.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

08.01 Locate and identify resource materials and develop a morgue.
08.02 Design logos.
08.03 Design stationery layouts.
08.04 Design a magazine/book cover or record jacket.
08.05 Design an ad campaign that includes newspapers, magazines and billboards.
08.06 Design a greeting card.
08.07 Design a business card.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 6
COURSE NUMBER: 8718060

COURSE DESCRIPTION:

This course is designed to provide instruction in employability skills and entrepreneurship.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify and adopt acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

14.0 DEMONSTRATE PROFICIENCY IN PERFORMING COMPUTERIZED CREATIVE SUPPORT OPERATIONS--The student will be able to:

14.01 Prepare desk-top publishing equipment for operations.
14.02 Operate desk-top publishing equipment.
14.03 Proofread desk-top copy.
14.04 Modify existing copy utilizing desk-top publishing equipment.
14.05 Prepare multiple-page copy utilizing desk-top publishing equipment.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Commercial Photography

CODE NUMBER: Secondary 8772000 Postsecondary ______

Florida CIP 0648.022400

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30, 31

CERTIFICATION COVERAGE: PHOTOG @ 7 G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as photographic process workers (89914721).

The program familiarizes individuals with various black and white film, their processes and printing of black and white film. The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, using film, camara, chemicals, photographic paper, laboratory practices and photographic equipment.

Listed below are the courses that comprise this program when offered at the secondary level:

8772010	Basic Commercial Photography 1
8772020	Basic Commercial Photography 2
8772030	Basic Commercial Photography 3
8772040	Basic Commercial Photography 4
8772050	Basic Commercial Photography 5
8772060	Basic Commercial Photography 6

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, materials, processes and precision equipment found in general use throughout the photography industry for the purpose of photographing, processing and presenting photography.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed. The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).
04. Operate various format cameras.
05. Finish photographs.
06. Understand and utilize various photographic lighting techniques.
07. Take studio photographs.
08. Reproduce photographic media.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial Education
PROGRAM TITLE: Basic Commercial Photography

EFFECTIVE DATE: July, 1993
SECONDARY NUMBER: 8772000
POSTSECONDARY NUMBER: ______

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.0 Hand-process black and white film.
01.0 Print black and white photographs.
01.0 Process black and white paper.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

02.01 Set appropriate f-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.
03.02 Compose photographs.
03.03 Take still photographs.
03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use 2¼ format camera.
04.02 Use view cameras.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.

06.0 UNDERSTAND AND UTILIZE VARIOUS PHOTOGRAPHIC LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.
08.02 Copy transparencies.
08.03 Make internegatives.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.

09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 1

COURSE NUMBER: 8722010

COURSE DESCRIPTION:

This is one course in a series of six courses that comprise the program. Introductory course in 35mm camera operation. The use of various light meters in the 35mm cameras as well as hand held light meters will be reviewed. Focusing systems are considered. Film types are compared to lighting conditions for proper exposures. Film loading and unloading are considered. The reciprocal value of apertures and shutter speeds are examined.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

02.01 Set appropriate f-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 2

COURSE NUMBER: 8722020

COURSE DESCRIPTION:

This course is one in a series of six courses. The guidelines of composing within the photographic frame are discussed. Posing one or more subjects for portraiture in the studio is considered. The guidelines for setting up a still life are introduced. Other rules for arranging groups, determining format, color harmony, and perspective are introduced.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.02 Compose photographs.
03.03 Take still photographs.

03.04 Take action photographs.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 3

COURSE NUMBER: 8722030

COURSE DESCRIPTION:

This is one course in a series of six courses. This course is designed to expose the student to the film procession and enlarging of with the use of photographic chemicals and solutions. Operation of the photographic enlarger is included.

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.02 Hand-process black and white film.
01.03 Print black and white photographs.
01.04 Process black and white paper.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 4

COURSE NUMBER: 8722040

COURSE DESCRIPTION:

This is one course in a series of six courses. This course is designed to expose the student in advanced instruction int he use of commercial cameras.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

- 04.01 Use 2¼ format camera.
- 04.02 Use view cameras.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 5

COURSE NUMBER: 8722050

COURSE DESCRIPTION:

This is one course in a series of six courses. The use of studio lights are reviewed for commercial photography. Formal portraiture lighting, as well as electronic strobe are examined.

06.0 UNDERSTAND AND UTILIZE VARIOUS PHOTOGRAPHIC LIGHTING TECHNIQUES--The student will be able to:

- 06.01 Take photographs with available light.
- 06.02 Take photographs with electronic strobe.
- 06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

- 07.01 Take commercial photographs.
- 07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

- 08.01 Copy prints.
- 08.02 Copy transparencies.
- 08.03 Make internegatives.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 6

COURSE NUMBER: 8722060

COURSE DESCRIPTION:

This is one course in a series of six courses. This course covers that methods of preparing photographic prints for presentation by means of mounting, matting, framing and spraying. Photographic spotting and retouching are also considered. Employability skills are covered in this course.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Basic Fire Sprinkler Installation
CODE NUMBER: Secondary 8721900 Postsecondary ______
Florida CIP 0646.052200

SECONDARY SCHOOL CREDITS 6
COLLEGE CREDITS ______
POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 ____ Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: PLUMBIN @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plumber, pipefitter helpers (98315982), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the assembly, installation, and repair of pipes, fittings, and fixtures for fire protection system according to specifications and National Fire Protection Association (NFPA) codes.

When taught at the secondary level the following courses comprise this program:

8721910	Basic Fire Sprinkler Installation 1
8721920	Basic Fire Sprinkler Installation 2
8721930	Basic Fire Sprinkler Installation 3
8721940	Basic Fire Sprinkler Installation 4
8721950	Basic Fire Sprinkler Installation 5
8721960	Basic Fire Sprinkler Installation 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of fire sprinkler tools to lay out, build, test, and maintain fire sprinkler systems in both residential and commercial applications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When the cooperative education method of instruction is used, the program length for the secondary program may be increased by a maximum of 2.0 credits.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic piping skills.
02. Perform pipe joining.
03. Read and interpret blueprints and specifications.
04. Layout a job and install underground.
05. Install first floor and above.
06. Trim out fire protection system.
07. Repair, service and maintain fire protection system.
08. Demonstrate general knowledge of fire protection.
09. Apply water supply requirements for sprinkler system.
10. Demonstrate installation of wet system.
11. Demonstrate installation of a dry system.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate entrepreneurship skills.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8721900
PROGRAM TITLE: Basic Fire Sprinkler Installation
POSTSECONDARY NUMBER: ____

01.0 PERFORM BASIC PIPING SKILLS - The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of fire protection.
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify fire sprinkler components.
01.09 Read, interpret and comply with manufacturer's schematics and specifications.
01.10 Find information in technical literature.
01.11 Give field reports orally and in writing.
01.12 Comply with oral and written instructions.

02.0 PERFORM PIPE JOINING - The student will be able to:

02.01 Join approved plastic pipe using the adapter-solvent cement method.
02.02 Cut plastic pipe.
02.03 Bend steel pipe with a heavy-duty bending tool.
02.04 Bend steel pipe with a chain vise and torch.
02.05 Cut steel pipe with a one-wheel steel pipe cutter.
02.06 Cut steel pipe with a four-wheel steel pipe cutter.
02.07 Join plastic pipe to steel pipe.
02.08 Thread steel pipe with an adjustable diestock.
02.09 Thread steel pipe with a non-adjustable diestock.
02.10 Thread steel pipe with a power-driven vise stand.
02.11 Cut copper tubing or pipe with a hacksaw.
02.12 Cut copper tubing or pipe with a tubing cutter.
02.13 Bend copper tubing or pipe with a bender.
02.14 Join copper tubing to copper pipe.
02.15 Join copper tubing to brass pipe.
02.16 Join copper tubing to steel pipe.
02.17 Join copper tubing or pipe to plastic pipe.
02.18 Join ductile and mechanical joint to fit.
02.19 Cut ductile iron.
02.20 Join steel pipe to ductile pipe.
02.21 Join plastic pipe to ductile pipe.
02.22 Braze pipe with a gas torch and filler metal.
02.23 Weld pipe with an oxyacetylene torch and filler metal.
02.24 Join pipe with an electric arc welder and filler metal.

03.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS - The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's and engineer's scale.
03.03 Interpret measuring devices.
03.04 Identify and define basic symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select material for specifications.

04.0 LAY OUT A JOB - The student will able to:

04.01 Lay out a job on site.
04.02 Test the underground.
04.03 Select material based on specifications.

05.0 INSTALL FIRST FLOOR AND ABOVE - The student will be able to:

05.01 Lay out a job on site.
05.02 Install hangers and supports.
05.03 Install risers and controls.
05.04 Install water distribution systems.
05.05 Test the pipe rough-in.

06.0 TRIM OUT FIRE PROTECTION SYSTEM - The student will be able to:

06.01 Install and trim out components.
06.02 Test and inspect the final installation.
06.03 Conduct purification tests.

07.0 REPAIR SERVICE, AND MAINTAIN FIRE PROTECTION SYSTEM - The student will be able to:

07.01 Establish positive customer relations.
07.02 Troubleshoot and diagnose systems.
07.03 Determine alternative solutions.
07.04 Repair fire service.
07.05 Repair leaks.
07.06 Repair or replace components.
07.07 Test and inspect repaired systems.
07.08 Prepare a job ticket.
07.09 Price a job and write the invoice.
07.10 Collect for service rendered.

08.0 DEMONSTRATE GENERAL KNOWLEDGE OF FIRE PROTECTION - The student will be able to:

08.01 Describe and explain the purpose of fire protection.
08.02 Apply basic theory and principles of fire protection codes.
08.03 Read and locate information in the Fire Codes.
08.04 Define terminology used in the Fire Code.
08.05 Explain why the Code may supersede manufacturer's specifications on products.

09.0 APPLY WATER SUPPLY REQUIREMENTS FOR SPRINKLER SYSTEM - The student will be able to:

09.01 Conduct a flow test.
09.02 Identify source of water supply.
09.03 Identify requirements of approving utility company.
09.04 Conduct a hydrostatic test.
09.05 Flush underground mains.
09.06 Complete test forms.

10.0 DEMONSTRATE INSTALLATION OF A WET SYSTEM - The student will be able to:

10.01 State the advantages and disadvantages of wet systems.
10.02 Identify types of control valves used in wet systems.
10.03 Place control valves at correct location.
10.04 Describe causes of unsatisfactory performance in a wet system.
10.05 Identify various hazards of wet system installations.
10.06 Identify spacing, location, and position sprinklers.

10.07 Pipe schedule a wet system.
10.08 State advantages of hydraulics designed wet system.
10.09 Test wet system.

11.0 DEMONSTRATE INSTALLATION OF A DRY SYSTEM - The student will be able to:

11.01 State the advantages and disadvantages of dry system.
11.02 Identify types of control valves used in dry systems.
11.03 Place control valves at correct locations.
11.04 Describe causes of unsatisfactory performance in a dry system.
11.05 Describe hazards of dry system installation.
11.06 Identify spacing, location, and position of sprinklers.
11.07 State recommended capacity of dry pipe system in U.S. gallons.
11.08 Pipe schedule a dry system.
11.09 State advantages of a hydraulic designed dry system.
11.10 Describe maximum time for water to reach remote inspector test.
11.11 Identify methods of charging a dry system.
11.12 Describe proper drainage of a dry pipe system and protection of dry valves.
11.13 Test dry system.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS - The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP - The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Fire Sprinkler Installation	PROGRAM NUMBER:	8721900
PROGRAM TITLE:	Basic Fire Sprinkler Installation 1	COURSE NUMBER:	8721910

COURSE DESCRIPTION:

This course is designed to provide training in residential plumbing piping skills and employability skills.

01.0 PERFORM BASIC PIPING SKILLS - The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of fire protection
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify fire sprinkler components.
01.09 Read, interpret and comply with manufacturer's schematics and specifications.
01.10 Find information in technical literature.
01.11 Give field reports orally and in writing.
01.12 Comply with oral and written instructions.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS - The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Fire Sprinkler Installation

PROGRAM NUMBER: 8721900

PROGRAM TITLE: Basic Fire Sprinkler Installation 2

COURSE NUMBER: 8721920

COURSE DESCRIPTION:

This course is designed to provide training in skills related to pipe joining and entrepreneurship.

02.0 PERFORM PIPE JOINING - The student will be able to:
- 02.01 Join approved plastic pipe using the adapter-solvent cement method.
- 02.02 Cut plastic pipe.
- 02.03 Bend steel pipe with a heavy-duty bending tool.
- 02.04 Bend steel pipe with a chain vise and torch.
- 02.05 Cut steel pipe with a one-wheel steel pipe cutter.
- 02.06 Cut steel pipe with a four-wheel steel piper cutter.
- 02.07 Join plastic pipe to steel pipe.
- 02.08 Thread steel pipe with an adjustable diestock.
- 02.09 Thread steel pipe with an non-adjustable diestock.
- 02.10 Thread steel pipe with a power-driven vise stand.
- 02.11 Cut copper tubing or pipe with a hacksaw.
- 02.12 Cut copper tubing or pipe with a tubing cutter.
- 02.13 Bend copper tubing or pipe with a bender.
- 02.14 Join copper tubing to copper pipe.
- 02.15 Join copper tubing to brass pipe.
- 02.16 Join copper tubing to steel pipe.
- 02.17 Join copper tubing or pipe to plastic pipe.
- 02.18 Join ductile and mechanical joint fit.
- 02.19 Cut ductile iron.
- 02.20 Join steel pipe to ductile pipe.
- 02.21 Join plastic pipe to ductile pipe.
- 02.22 Braze pipe with a gas torch and filler metal.
- 02.23 Weld pipe with an oxyacetylene torch and filler metal.
- 02.24 Join pipe with an electric arc welder and filler metal.

16.0 DEMONSTRATE ENTREPRENEURSHIP SKILLS - The student will be able to:

- 16.01 Define entrepreneurship.
- 16.02 Describe the importance of entrepreneurship to the American economy.
- 16.03 List the advantages and disadvantages business ownership.
- 16.04 Identify the risks involved in ownership of a business.
- 16.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Fire Sprinkler Installation

PROGRAM NUMBER: 8721900

PROGRAM TITLE: Basic Fire Sprinkler Installation 3

COURSE NUMBER: 8721930

COURSE DESCRIPTION:

This course is designed to provide training in skills related to reading blueprints and specifications, and laying out a job.

03.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS - The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's and engineer's scale.
03.03 Interpret a measuring device.
03.04 Identify and define basic symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select material for specifications.

04.0 LAY OUT A JOB - The student will able to:

04.01 Lay out a job on site.
04.02 Test the underground.
04.03 Select material based on specifications.

05.0 INSTALL FIRST FLOOR AND ABOVE - The student will be able to:

05.01 Lay out a job on site.
05.02 Install hangers and supports.
05.03 Install risers and controls.
05.04 Install water distribution systems.
05.05 Test the pipe rough-in.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial

PROGRAM TITLE: Basic Fire Sprinkler Installation

PROGRAM TITLE: Basic Fire Sprinkler Installation 4

EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1

PROGRAM NUMBER: 8721900

COURSE NUMBER: 8721940

COURSE DESCRIPTION:

This course is designed to provide skills related to general knowledge of fire protection, and applying water supply requirements.

08.0 DEMONSTRATE GENERAL KNOWLEDGE OF FIRE PROTECTION - The student will be able to:

08.01 Describe and explain the purpose of fire protection.
08.02 Apply basic theory and principles of fire protection codes.
08.03 Read and locate information in the Fire Codes.
08.04 Define terminology used in the Fire Code.
08.05 Explain why the Code may supersede manufacturer's specifications on products.

09.0 APPLY WATER SUPPLY REQUIREMENTS FOR SPRINKLER SYSTEM - The student will be able to:

09.01 Conduct a flow test.
09.02 Identify source of water supply.
09.03 Identify requirement of approving utility company.
09.04 Conduct a hydrostatic test.
09.05 Flush underground mains.
09.06 Complete test forms.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Fire Sprinkler Installation

PROGRAM NUMBER: 8721900

PROGRAM TITLE: Basic Fire Sprinkler Installation 5

COURSE NUMBER: 8721950

COURSE DESCRIPTION:

This course is designed to provide training in the installation of wet and dry fire protection systems.

10.0 DEMONSTRATE INSTALLATION OF A WET SYSTEM - The student will be able to:

10.01 State the advantages and disadvantages of wet systems.
10.02 Identify types of control valves used in wet systems.
10.03 Place control valve at correct location.
10.04 Describe causes of unsatisfactory performance in a set system.
10.05 Identify various hazards of wet system installations.
10.06 Identify spacing, location, and position sprinklers.
10.07 Pipe schedule a wet system/
10.08 State advantages of hydraulics designed wet system.
10.09 Test wet system.

11.0 DEMONSTRATE INSTALLATION OF A DRY SYSTEM - The student will be able to:

11.01 State the advantages and disadvantages of dry system.
11.02 Identify types of control valves used in dry systems.
11.03 Place control valves at correct locations.
11.04 Describe causes of unsatisfactory performance in a dry system.
11.05 Describe hazards of dry system installation.
11.06 Identify spacing, location, and position of sprinklers.
11.07 State recommended capacity of dry pipe system in U.S. gallons.
11.08 Pipe schedule a dry system.
11.09 State advantages of a hydraulic designed dry system.
11.10 Describe maximum time for water to reach remote inspector test.
11.11 Identify methods of charging a dry system.
11.12 Describe proper drainage of a dry pipe system and protection of dry valves.
11.13 Test dry system.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Fire Sprinkler Installation

PROGRAM NUMBER: 8721900

PROGRAM TITLE: Basic Fire Sprinkler Installation 6

COURSE NUMBER: 8721960

COURSE DESCRIPTION:

This course is designed to provide training in trimming out a fire protection system, and repair and maintenance of a system.

06.0 TRIM OUT FIRE PROTECTION SYSTEM - The student will be able to:

06.01 Install and trim out components.
06.02 Test and inspect the final installation.
06.03 Conduct purification tests.

07.0 REPAIR SERVICE AND MAINTAIN FIRE PROTECTION SYSTEM - The student will be able to:

07.01 Establish positive customer relations.
07.02 Troubleshoot and diagnose systems.
07.03 Determine alternative solutions.
07.04 Repair fire service.
07.05 Repair leaks.
07.06 Repair or replace components.
07.07 Test and inspect repaired systems.
07.08 Prepare a job ticket.
07.09 Price a job and write the invoice.
07.10 Collect for service rendered.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Basic Gasoline Engine Mechanics
CODE NUMBER: Secondary 8766000
Postsecondary ______
Florida CIP 0647.062600
SECONDARY SCHOOL CREDITS 6
COLLEGE CREDITS ___
POSTSECONDARY ADULT VOCATIONAL CREDITS ___
APPLICABLE LEVEL(S): ___ 7-9 x 9-12 ___ Postsecondary Adult Vocational
___ Postsecondary Vocational x Other 30,31
CERTIFICATION COVERAGE: GASENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as small engine specialists (85328638), gas engine repairers (625.281-026). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic math skills; reading service manuals; use of microfiche and parts catalogs; use of hand tools, power tools and overhaul tools; servicing and reconditioning of engines; and troubleshooting and repairing of governors, speed controls, lubrication, ignition, fuel, power transfer, cooling exhaust and starting systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8766010	Basic Gasoline Engine Mechanics 1
8766020	Basic Gasoline Engine Mechanics 2
8766030	Basic Gasoline Engine Mechanics 3
8766040	Basic Gasoline Engine Mechanics 4
8766050	Basic Gasoline Engine Mechanics 5
8766060	Basic Gasoline Engine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work

station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Identify and properly use laboratory tools and equipment.
03. Demonstrate proficiency in applying customer service skills.
04. Demonstrate proficiency in repairing and maintaining basic two-stroke cycle engines.
05. Demonstrate proficiency in repairing and maintaining basic four-stroke cycle engines.
06. Diagnose and repair ignition systems.
07. Service fuel systems.
08. Service, repair and adjust engine controls.
09. Repair and service lubrication systems.
10. Service cooling and exhaust systems.
11. Diagnose, service, repair and adjust electrical systems.
12. Service and repair starting systems.
13. Demonstrate proficiency in repairing engine interior components.
14. Demonstrate proficiency in diagnosing and repairing power transfer systems.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: 8766000

PROGRAM TITLE: Basic Gasoline Engine Mechanics

POSTSECONDARY NUMBER: ______

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Practice shop safety rules and procedures.
01.02 Practice personal safety rules and procedures.
01.03 Practice fire safety rules and procedures.
01.04 Practice electrical safety rules and procedures.
01.05 Practice air tools safety rules and procedures.
01.06 Maintain a clean engine repair shop.

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT--The student will be able to:

02.01 Use general hand tools.
02.02 Use special hand tools.
02.03 Use precision measuring tools.
02.04 Use power tools.
02.05 Use fasteners.
02.06 Use gaskets and choose sealants.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

03.01 Prepare service orders properly.
03.02 Communicate solutions to customers.
03.03 Locate engine models and types.
03.04 Follow manufacturers' service manuals.
03.05 Locate parts in a parts catalog or on microfiche.
03.06 Complete service or work orders including any warranty information required by the manufacturer.

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

04.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
04.02 Identify types of engines.
04.03 Locate engine serial and model numbers.
04.04 Identify engine assemblies and systems.
04.05 Disassemble engines.
04.06 Remove, clean and inspect the head for cracks, warpage and damaged spark plug threads.
04.07 Remove, clean and inspect piston rods and assemblies.
04.08 Measure out-of-round piston and cylinder.
04.09 Check the total bearing surface of connecting rod bearings.
04.10 Measure piston skirts and ring grooves.
04.11 Measure the piston ring gap in the cylinder bore.
04.12 Install piston pins according to manufacturer's specifications.
04.13 Check rod and piston assembly alignment.
04.14 Install rings on pistons.
04.15 Install piston rod assemblies.
04.16 Check needle bearings.
04.17 Inspect crankshafts and install seals.
04.18 Inspect,clean and/or replace reed valves.
04.19 Reassemble engines.

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.
05.02 Identify types of four-stroke cycle engines.
05.03 Locate engine serial and model numbers.
05.04 Identify engine assemblies and systems.
05.05 Disassemble engines.
05.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
05.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
05.08 Grind valve seats and reface valves.
05.09 Check and inspect springs for free height, distortion and installed height.
05.10 Adjust valve lash.
05.11 Remove and inspect camshafts and lifters.
05.12 Measure camshafts.
05.13 Service camshaft bearings.
05.14 Clean and inspect lifters for wear.
05.15 Time valve drive assemblies.
05.16 Remove piston from rods assemblies.
05.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
05.18 Check piston pins and bosses for wear.
05.19 Measure piston ring lands width, out-of-round and taper.
05.20 Measure the piston ring gap in the cylinder bore.
05.21 Install and fit piston pins.
05.22 Check rod and piston assembly alignment.
05.23 Remove and replace rod bearings.
05.24 Hone and clean cylinders.
05.25 Install rings on pistons.
05.26 Measure and check crankshafts with a micrometer.
05.27 Check for end play.
05.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
05.29 Reassemble engines.
05.30 Install oil seals.

06.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS-The student will be able to:

06.01 Identify and diagnose ignition systems and components.
06.02 Repair magneto ignition systems.
06.03 Repair solid-state ignition systems.
06.04 Repair battery ignition systems.
06.05 Repair impulse ignition systems.
06.06 Identify spark plugs and special applications.
06.07 Remove, adjust and replace spark plugs.
06.08 Adjust ignition system timing.

07.0 SERVICE FUEL SYSTEMS--The student will be able to:

07.01 Service air filters.
07.02 Service or replace fuel filters.
07.03 Service and repair suction-type carburetors.
07.04 Service and repair diaphragm-type carburetors.
07.05 Service and repair float-type carburetors.
07.06 Remove and service fuel supply systems.
07.07 Determine and use correct fuel and fuel mixtures.

08.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

08.01 Service, repair and adjust governor speed controls.
08.02 Service, repair and adjust remote speed controls.
08.03 Service, repair and adjust manual start-stop controls.
08.04 Service, repair and adjust electrical start-stop controls.
08.05 Service, repair and adjust zone systems.
08.06 Service, repair and adjust blade clutch controls.
08.07 Service, repair and adjust chain brake systems.
08.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
08.09 Comply with the CPA for interlocks.
08.10 Comply with the CPA for blade tip speed.
08.11 Read and interpret CPA rules and regulations.

09.0 REPAIR AND SERVICE LUBRICATION SYSTEMS--The student will be able to:

09.01 Service crankcase breathers.
09.02 Replace seals and gaskets.
09.03 Identify oil grade terms.
09.04 Identify lubrication systems.
09.05 Identify, understand and relate types and ratios of two-cycle mix oils and their relationship to specific pieces of equipment.

10.0 SERVICE COOLING AND EXHAUST SYSTEMS--The student will be able to:

10.01 Service air cooling fins and screens.
10.02 Service two-cycle exhaust systems.
10.03 Service four-cycle exhaust systems.

11.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

11.01 Operate electrical testing instruments.
11.02 Replace electrical system components.
11.03 Test and service batteries according to manufacturer's requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours).
11.04 Diagnose electrical system components.
11.05 Service, repair and adjust charging systems.

12.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

12.01 Service and repair manual starting systems.
12.02 Service and repair electrical starting systems.
12.03 Test and service battery starting systems.

13.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

13.01 Service, repair and adjust valve systems.
13.02 Service, repair and adjust rings, bores and pistons.
13.03 Service, repair and adjust crankshafts and bearings.
13.04 Service, repair and adjust rods.
13.05 Service, repair and adjust lubrication systems.
13.06 Service, repair and adjust internal governor.
13.07 Service, repair and adjust internal components timing.
13.08 Assemble complete engines to manufacturer's specifications.

14.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

14.01 Inspect and measure belts and chains.

14.02 Install belts and chains.
14.03 Repair manual transmissions.
14.04 Repair differentials.
14.05 Identify power transfer system components.
14.06 Replace drive components.
14.07 Remove and repair clutches.
14.08 Sharpen and balance blades.
14.09 Remove and replace or install blades correctly.
14.10 Remove and replace hydraulic pump systems.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as

recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Gasoline Engine Mechanics	PROGRAM NUMBER:	8766000
COURSE TITLE:	Basic Gasoline Engine Mechanics 1	COURSE NUMBER:	8766010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing laboratory skills to industry standards and applying customer service and basic mathematics skills.

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Practice shop safety rules and procedures.
01.02 Practice personal safety rules and procedures.
01.03 Practice fire safety rules and procedures.
01.04 Practice electrical safety rules and procedures.
01.05 Practice air tools safety rules and procedures.
01.06 Maintain a clean engine repair shop.

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT--The student will be able to:

02.01 Use general hand tools.
02.03 Use special hand tools.
02.04 Use power tools.
02.05 Use fasteners.
02.06 Use gaskets and choose sealants.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

03.01 Prepare service orders properly.
03.02 Communicate solutions to customers.
03.03 Locate engine models and types.
03.04 Follow manufacturer's service manuals.
03.05 Locate parts in a parts catalog or on microfiche.
03.06 Complete service or work orders including any warranty information required by the manufacturer.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Gasoline Engine Mechanics	PROGRAM NUMBER:	8766000
COURSE TITLE:	Basic Gasoline Engine Mechanics 2	COURSE NUMBER:	8766020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and maintaining basic two-stroke and four-stroke cycle engines.

04.0 **DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES**--The student will be able to:

04.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
04.02 Identify types of engines.
04.03 Locate engine serial and model numbers.
04.04 Identify engine assemblies and systems.
04.05 Disassemble engines.
04.06 Remove, clean and inspect the head for cracks, warpage and damaged spark plug threads.
04.07 Remove, clean and inspect piston rods and assemblies.
04.08 Measure out-of-round piston and cylinder.
04.09 Check the total bearing surface of connecting rod bearings.
04.10 Measure piston skirts and rig grooves.
04.11 Measure the piston ring gap in the cylinder bore.
04.12 Install piston pins according to manufacturer's specifications.
04.13 Check rod and piston assembly alignment.
04.14 Install rings on pistons.
04.15 Install piston rod assemblies.
04.16 Check needle bearings.
04.17 Inspect crankshafts and install seals.
04.18 Inspect, clean and/or replace reed valves.
04.19 Reassemble engines.

05.0 **DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES**--The student will be able to:

05.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.
05.02 Identify types of four-stroke cycle engines.
05.03 Locate engine serial and model numbers.
05.04 Identify engine assemblies and systems.
05.05 Disassemble engines.
05.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
05.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
05.08 Grind valve seats and reface valves.
05.09 Check and inspect springs for free height, distortion and installed height.
05.10 Adjust valve lash.
05.11 Remove and inspect camshafts and lifters.
05.12 Measure camshafts.
05.13 Service camshaft bearings.
05.14 Clean and inspect lifters for wear.
05.15 Time valve drive assemblies.
05.16 Remove piston from rods assemblies.
05.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
05.18 Check piston pins and bosses for wear.
05.19 Measure piston ring lands width, out-of-round and taper.
05.20 Measure the piston ring gap in the cylinder bore.
05.21 Install and fit piston pins.
05.22 Check rod and piston assembly alignment.
05.23 Remove and replace rod bearings.
05.24 Hone and clean cylinders.
05.25 Install rings on pistons.
05.26 Measure and check crankshafts with a micrometer
05.27 Check for end play.
05.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.

05.29 Reassemble engines.
05.30 Install oil seals.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics

PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 3

COURSE NUMBER: 8766030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and servicing ignition systems, fuel systems and engine controls.

06.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS--The student will be able to:

06.01 Identify and diagnose ignition systems and components.
06.02 Repair magneto ignition systems.
06.03 Repair solid-state ignition systems.
06.04 Repair battery ignition systems.
06.05 Repair impulse ignition systems.
06.06 Identify spark plugs and special applications.
06.07 Remove, adjust and replace spark plugs.
06.08 Adjust ignition system timing.

07.0 SERVICE FUEL SYSTEMS--The student will be able to:

07.01 Service air filters.
07.02 Service or replace fuel filters.
07.03 Service and repair suction-type carburetors.
07.04 Service and repair diaphragm-type carburetors.
07.05 Service and repair float-type carburetors.
07.06 Remove and service fuel supply systems.
07.07 Determine and use correct fuel and fuel mixtures.

08.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

08.01 Service, repair and adjust governor speed controls.
08.02 Service, repair and adjust remote speed controls.
08.03 Service, repair and adjust manual start-stop controls.
08.04 Service, repair and adjust electrical start-stop controls.
08.05 Service, repair and adjust zone systems.
08.06 Service, repair and adjust blade clutch controls.
08.07 Service, repair and adjust chain brake systems.
08.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
08.09 Comply with the CPA for interlocks.
08.10 Comply with the CPA for blade tip speed.
08.11 Read and interpret CPA rules and regulations.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics

PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 4

COURSE NUMBER: 8766040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and maintaining lubrication, cooling and exhaust systems.

09.0 REPAIR AND SERVICE LUBRICATION SYSTEMS--The student will be able to:

09.01 Service crankcase breathers.
09.02 Replace seals and gaskets.
09.03 Identify oil grade terms.
09.04 Identify lubrication systems.
09.05 Identify, understand and relate types and ratios of two-cycle mix oils and their relationship to specific pieces of equipment.

10.0 SERVICE COOLING AND EXHAUST SYSTEMS--The student will be able to:

10.01 Service air cooling fins and screens.
10.02 Service two-cycle exhaust systems.
10.03 Service four-cycle exhaust systems.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics

PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 5

COURSE NUMBER: 8766050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and servicing electrical systems, starting systems and engine interior components.

11.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

11.01 Operate electrical testing instruments.
11.02 Replace electrical system components.
11.03 Test and service batteries according to manufacturer's requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours).
11.04 Diagnose electrical system components.
11.05 Service, repair and adjust charging systems.

12.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

12.01 Service and repair manual starting systems.
12.02 Service and repair electrical starting systems.
12.03 Test and service battery starting systems.

13.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

13.01 Service, repair and adjust valve systems.
13.02 Service, repair and adjust rings, bores and pistons.
13.03 Service, repair and adjust crankshafts and bearings.
13.04 Service, repair and adjust rods.
13.05 Service, repair and adjust lubrication systems.
13.06 Service, repair and adjust internal governor.
13.07 Service, repair and adjust internal components timing.
13.08 Assemble complete engines to manufacturer's specifications.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics

PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 6

COURSE NUMBER: 8766060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing power transfer systems.

14.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

14.01 Inspect and measure belts and chains.
14.02 Install belts and chains.
14.03 Repair manual transmissions.
14.04 Repair differentials.
14.05 Identify power transfer system components.
14.06 Replace drive components.
14.07 Remove and repair clutches.
14.08 Sharpen and balance blades.
14.09 Remove and replace or install blades correctly.
14.10 Remove and replace hydraulic pump systems.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Motorcycle Mechanics

CODE NUMBER: Secondary 8766100 Postsecondary ___

Florida CIP 0647.062601

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: MOTORCYCLE @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as motorcycle repairers (85308636), or motorcycle subassembly repairers (620.684-026) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintain frames, suspension, wheels and brakes, drive trains and engines, as well as service systems to prevent mechanical failure.

Listed below are the courses that comprise this program when offered at the secondary level:

8766110	Basic Motorcycle Mechanics 1
8766120	Basic Motorcycle Mechanics 2
8766130	Basic Motorcycle Mechanics 3
8766140	Basic Motorcycle Mechanics 4
8766150	Basic Motorcycle Mechanics 5
8766160	Basic Motorcycle Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in all systems on motorcycles including electrical, power, drive, fuel and exhaust systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student will receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Utilize hand tools, equipment and materials.
03. Maintain frames and suspension.
04. Maintain wheels and brakes.
05. Maintain drive trains.
06. Service fuel and exhaust systems.
07. Perform tune-ups.
08. Service electrical systems.
09. Maintain and repair engines.
10. Apply allied trades.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Basic Motorcycle Mechanics

EFFECTIVE DATE: July, 1993
SECONDARY NUMBER: 8766100
POSTSECONDARY NUMBER: ______

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of safety rules.
01.02 Demonstrate understanding of shop and class procedures.

02.0 UTILIZE HAND TOOLS, EQUIPMENT, AND MATERIALS--The student will be able to:

02.01 Identify hand tools.
02.02 Utilize measuring tools.
02.03 Utilize and maintain basic shop equipment.
02.04 Identify and use standard fasteners.
02.05 Identify gaskets and choose sealants.
02.06 Use parts and service manuals.

03.0 MAINTAIN FRAMES AND SUSPENSION--The student will be able to:

03.01 Service and overhaul front suspension.
03.02 Service and overhaul rear suspension.

04.0 MAINTAIN WHEELS AND BRAKES--The student will be able to:

04.01 Remove and replace hub.
04.02 Remove and remount tires.
04.03 Overhaul drum brakes.
04.04 Overhaul hydraulic brakes.

05.0 MAINTAIN DRIVE TRAINS--The student will be able to:

05.01 Replace chain and sprocket.
05.02 Overhaul primary drive.
05.03 Overhaul transmission.
05.04 Service kickstart systems.

06.0 SERVICE FUEL AND EXHAUST SYSTEMS--The student will be able to:

06.01 Identify components and operation of carburetors.
06.02 Diagnose and repair slide type carburetors.
06.03 Diagnose and repair CV type carburetors.
06.04 Diagnose and repair exhaust system.
06.05 Troubleshoot and repair fuel delivery systems.

07.0 PERFORM TUNE-UPS--The student will be able to:

07.01 Diagnose performance problems.
07.02 Adjust valve clearance and cam chain.
07.03 Replace ignition points and timing.
07.04 Adjust carburetor and service fuel delivery systems.
07.05 Tune-up two stroke motorcycles.
07.06 Tune-up single cylinder motorcycles (four-stroke).
07.07 Tune-up multi-cylinder motorcycles (four-stroke).
07.08 Service air filters.
07.09 Service and diagnose storage battery.
07.10 Service lubrication system

08.0 SERVICE ELECTRICAL SYSTEMS--The student will be able to:

08.01 Apply electrical theory.
08.02 Utilize electrical test equipment.
08.03 Read wiring diagram.
08.04 Troubleshoot and repair wire system.
08.05 Troubleshoot and repair battery ignition system.
08.06 Troubleshoot and repair magneto and CDI ignition systems.
08.07 Troubleshoot and repair half-wave and full-wave charging systems.
08.08 Troubleshoot and repair 3-phase charging system.
08.09 Troubleshoot and repair electrical starter system.

09.0 MAINTAIN AND REPAIR ENGINES--The student will be able to:

09.01 Apply engine operating theory.
09.02 Overhaul single cylinder 4-stroke top-end.
09.03 Overhaul multi-cylinder 4-stroke top-end.
09.04 Overhaul two stroke top-end.
09.05 Perform complete overhaul on single cylinder 4-stroke engines.
09.06 Perform complete overhaul on two stroke engine.
09.07 Service and repair water cooling systems.

10.0 APPLY ALLIED TRADES--The student will be able to:

10.01 Utilize oxyacetylene welding outfit for heating, welding, brazing and cutting.
10.02 Utilize propane torch for miscellaneous operations.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to

work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics

PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 1

COURSE NUMBER: 8766110

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab, rules and grading procedures, hand and power tools and employability skills.

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of safety rules.
01.02 Demonstrate understanding of shop and class procedures.

02.0 UTILIZE HAND TOOLS, EQUIPMENT, AND MATERIALS--The student will be able to:

02.01 Identify hand tools.
02.02 Utilize measuring tools.
02.03 Utilize and maintain basic shop equipment.
02.04 Identify and use standard fasteners.
02.05 Identify gaskets and choose sealants.
02.06 Use parts and service manuals.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 2 COURSE NUMBER: 8766120

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in maintaining motorcycle frames, suspensions, wheels, and brakes.

03.0 MAINTAIN FRAMES AND SUSPENSION--The student will be able to:

  03.01 Service and overhaul front suspension.
  03.02 Service and overhaul rear suspension.

04.0 MAINTAIN WHEELS AND BRAKES--The student will be able to:

  04.01 Remove and replace hub.
  04.02 Remove and remount tires.
  04.03 Overhaul drum brakes.
  04.04 Overhaul hydraulic brakes.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 3 COURSE NUMBER: 8766130

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in motorcycle drive trains, fuel and exhaust systems.

05.0 MAINTAIN DRIVE TRAINS--The student will be able to:

  05.01 Replace chain and sprocket.
  05.02 Overhaul primary drive.
  05.03 Overhaul transmission.
  05.04 Service kickstart systems.

06.0 SERVICE FUEL AND EXHAUST SYSTEMS--The student will be able to:

  06.01 Identify components and operation of carburetors.
  06.02 Diagnose and repair slide type carburetors.
  06.03 Diagnose and repair CV type carburetors.
  06.04 Diagnose and repair exhaust system.
  06.05 Troubleshoot and repair fuel delivery systems.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100
COURSE TITLE: Basic Motorcycle Mechanics 4 COURSE NUMBER: 8766140

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in motorcycle tune-up include single and multi-cylinder engines, two and four stroke.

07.0 PERFORM TUNE-UPS--The student will be able to:

07.01 Diagnose performance problems.
07.02 Adjust valve clearance and cam chain.
07.03 Replace ignition points and timing.
07.04 Adjust carburetor and service fuel delivery systems.
07.05 Tune-up two stroke motorcycles.
07.06 Tune-up single cylinder motorcycles (four-stroke).
07.07 Tune-up multi-cylinder motorcycles (four-stroke).
07.08 Service air filters.
07.09 Service and diagnose storage battery.
07.10 Service lubrication system

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100
COURSE TITLE: Basic Motorcycle Mechanics 5 COURSE NUMBER: 8766150

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in electrical system service.

08.0 SERVICE ELECTRICAL SYSTEMS--The student will be able to:

08.01 Apply electrical theory.
08.02 Utilize electrical test equipment.
08.03 Read wiring diagram.
08.04 Troubleshoot and repair wire system.
08.05 Troubleshoot and repair battery ignition system.
08.06 Troubleshoot and repair magneto and CDI ignition systems.
08.07 Troubleshoot and repair half-wave and full-wave charging systems.
08.08 Troubleshoot and repair 3-phase charging system.
08.09 Troubleshoot and repair electrical starter system.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100
COURSE TITLE: Basic Motorcycle Mechanics 6 COURSE NUMBER: 8766160

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in engine repair and maintenance.

09.0 MAINTAIN AND REPAIR ENGINES--The student will be able to:

09.01 Apply engine operating theory.
09.02 Overhaul single cylinder 4-stroke top-end.
09.03 Overhaul multi-cylinder 4-stroke top-end.
09.04 Overhaul two stroke top-end.
09.05 Perform complete overhaul on single cylinder 4-stroke engines.
09.06 Perform complete overhaul on two stroke engine.
09.07 Service and repair water cooling systems.

10.0 APPLY ALLIED TRADES--The student will be able to:

10.01 Utilize oxyacetylene welding outfit for heating, welding, brazing and cutting.
10.02 Utilize propane torch for miscellaneous operations.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

CURRICULUM FRAMEWORK
FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Industrial
EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Sheet Metal

CODE NUMBER: Secondary 8754100 Postsecondary _______
Florida CIP 0648.052600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ____7-9 x 9-12 ____Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: SHEET METAL @ 7 G METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as sheet metal workers (89132677), machine helpers (619.687-014), template cutters (703.684-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the layout, fabrication, erection, or installation and maintenance of items made of sheet steel, copper, stainless steel and aluminum using hand tools and machines.

Listed below are the courses that comprise this program when offered at the secondary level:

8754110	Basic Sheet Metal 1
8754120	Basic Sheet Metal 2
8754130	Basic Sheet Metal 3
8754140	Basic Sheet Metal 4
8754150	Basic Sheet Metal 5
8754160	Basic Sheet Metal 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in layout, cutting, forming, fabricating and installing mechanical, architectural, and specialty metal products.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and trade safety practices.
02. Read blueprints.
03. Lay out sheet metal.
04. Fabricate mechanical systems.
05. Fabricate architectural/roofing sheet metal.
06. Fabricate specialty sheet metal.
07. Fabricate food and beverage dispensing equipment.
08. Weld sheet metal.
09. Install mechanical systems.
10. Install architectural/roofing sheet metal.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal
POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES--The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonstrate use and care of tools.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
02.04 Develop shop drawings.

03.0 LAY OUT SHEET METAL--The student will be able to:

03.01 Lay out rectangular straight duct.
03.02 Lay out rectangular square throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS--The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow.
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset.
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket government lock.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct section.

05.0 FABRICATE ARCHITECTURAL/ROOFING SHEET METAL--The student will be able to:

05.01 Fabricate batten seam metal roof panel and cap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-lock roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular downspout/conductor.
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel stop fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.
05.14 Fabricate metal ceiling panel.

06.0 FABRICATE SPECIALTY SHEET METAL--The student will be able to:
06.01 Fabricate rectangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.
06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice).

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT--The student will be able to:
07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet drawer.
07.05 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL--The student will be able to:
08.01 Weld aluminum with gas tungsten arc welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless steel with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tungsten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) equipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel,copper and stainless steel.

09.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:
09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single wall equipment casing/housing.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL--the student will be able to:

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee gutter.
10.05 Install half-round gutter.
10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing.
10.10 Install coping.
10.11 Install gravel stop fascia.
10.12 Install metal siding.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:
13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARD

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal

PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 1

COURSE NUMBER: 8754110

COURSE DESCRIPTION:

This course is designed to provide an introduction to basic safety rules and procedures, school and classroom/lab procedures and the basic use and care of sheet metal hand tools. Students will be provided instruction in blueprint reading, interpreting drawings, reading symbols, testing materials and developing shop drawings.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES--The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonstrate use and care of tools.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
02.04 Develop shop drawings.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.

15.06 Identify the business skills needed to operate a small business efficiently and effectively.

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STUDENT PERFORMANCE STANDARD EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 2 COURSE NUMBER: 8754120

COURSE DESCRIPTION:

This course is designed to provide basic competencies in sheet metal layout as well as the basic competencies required in mechanical systems fabrication.

03.0 LAY OUT SHEET METAL--The student will be able to:

03.01 Lay out rectangular straight duct.
03.02 Lay out rectangular square throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS--The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow.
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset.
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket government lock.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct section.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using

millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

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STUDENT PERFORMANCE STANDARD EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 3 COURSE NUMBER: 8754130

COURSE DESCRIPTION:

This course is designed to provide instruction in architectural/roofing sheet metal fabrication and instruction in specialty sheet metal fabrication.

05.0 FABRICATE ARCHITECTURAL/ROOFING SHEET METAL--The student will be able to:

05.01 Fabricate batten seam metal roof panel and cap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-lock roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular downspout/conductor.
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel stop fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.
05.14 Fabricate metal ceiling panel.

06.0 FABRICATE SPECIALTY SHEET METAL--The student will be able to:

06.01 Fabricate rectangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.
06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice).

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STUDENT PERFORMANCE STANDARD EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 4 COURSE NUMBER: 8754140

COURSE DESCRIPTION:

This course is designed to provide instruction in fabricating food and beverage dispensing equipment and introduction of basic competencies required in sheet metal welding including aluminum/gas tungsten arc, stainless steel/arc, gas-tungsten, carbon arc and brazing, griding, soldering and polishing metal.

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT--The student will be able to:

07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet drawer.
07.05 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL--The student will be able to:

08.01 Weld aluminum with gas tungsten arc welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless steel with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tungsten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) equipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel, copper and stainless steel.

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STUDENT PERFORMANCE STANDARD

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal

PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 5

COURSE NUMBER: 8754150

COURSE DESCRIPTION:

This course is designed to provide instruction in the basic competencies required in the installation of sheet metal systems.

09.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single wall equipment casing/housing.

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STUDENT PERFORMANCE STANDARD

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal

PROGRAM NUMBER: 8754100

PROGRAM TITLE: Basic Sheet Metal 6

COURSE NUMBER: 8754160

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in the installation of architectural/roofing systems.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee gutter.
10.05 Install half-round gutter.
10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing.
10.10 Install coping.
10.11 Install gravel stop fascia.
10.12 Install metal siding.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Television Production

CODE NUMBER: Secondary 8772100 Postsecondary ______

Florida CIP 0610.010403

SECONDARY SCHOOL CREDITS __X__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational ______ Other 30, 31

CERTIFICATION COVERAGE: ¶TEC ELEC @ 7 G TV PRO TEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as television production operators, (34028252) television broadcast technicians, (34026187) camera operator, (39999268) all other professional/para-professional technicians, video recording engineers, audio recording engineers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but is not be limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; and preparation to assume responsibility for overall production of television studio activities including: scripts, lighting, filming and directing, electronic news gathering, and field production.

Listed below are the courses that comprise this program when offered at the secondary level:

8772110	Basic Television Production 1
8772120	Basic Television Production 2
8772130	Basic Television Production 3
8772140	Basic Television Production 4
8772150	Basic Television Production 5
8772160	Basic Television Production 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in camera principles,audio and video control, lighting methods, control room operation, station operation, and set preparation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When the cooperative education method of instruction is used, the program length for the secondary program may be increased by a maximum of 2.0 credits.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Exhibit knowledge of the history of television and its role in the mass media.
02. Demonstrate knowledge of the television production technology program instructional system, safety procedures and trade terminology.
03. Plan a set for television production.
04. Perform lighting activities for a planned production.
05. Demonstrate correct use of basic equipment used in television production.
06. Demonstrate ability to identify different types of script copy.
07. Demonstrate ability to write script to broadcast style.
08. Exhibit a knowledge of the television production team.
09. Exhibit ability to apply skills through planning, writing, directing, editing and recording a television program.
10. Perform video tape recording and editing operations.
11. Perform television production and programming activities.
12. Perform character generator and special effects generator functions.
13. Operate television studio audio control system.
14. Perform electronic news gathering (ENG) and electronic field production (EFP) equipment functions.
15. Perform routine operator preventative maintenance operations.
16. Write, produce, direct and edit a variety of television programming.
17. Demonstrate ability in studio production regarding the selection and quality of production topics, use of appropriate equipment and adherence to production deadlines.
18. Understand career opportunities in the television industry.
19. Demonstrate an independent level of proficiency in one or more areas of television production.
20. Demonstrate an ability to specialize in one or more areas of television production.
21. Translate a written script into a full television production.
22. Demonstrate appropriate communication skills.
23. Demonstrate appropriate math skills.
24. Demonstrate appropriate understanding of basic science.
25. Demonstrate employability skills.
26. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　SECONDARY NUMBER: 8772100

PROGRAM TITLE: Basic Television Production　　POSTSECONDARY NUMBER:

01.0 EXHIBIT KNOWLEDGE OF THE HISTORY OF TELEVISION AND ITS ROLE IN THE MASS MEDIA--The student will be able to:

01.01 Describe the pre-electronic mass communication processes.
01.02 Describe the growth of communication to include the telegraph, the wireless, early radio and television.
01.03 Describe the development of networks and their impact on broadcasting.
01.04 Describe the social and political impact of television.
01.05 Discuss recent technological developments and the future of telecommunications.
01.06 Discuss recent programming developments and the future of telecommunications.

02.0 DEMONSTRATE KNOWLEDGE OF THE TELEVISION PRODUCTION TECHNOLOGY PROGRAM INSTRUCTIONAL SYSTEM, SAFETY PROCEDURES AND TRADE TERMINOLOGY--The student will be able to:

02.01 Describe the operating system of the vocational program.
02.02 State and apply general safety rules for operation of equipment and learning activities in the lab.
02.03 Utilize trade terminology in the television production lab.
02.04 Utilize trade abbreviations and acronyms as appropriate.
02.05 Transport equipment safely and securely.
02.06 Store equipment in appropriate locations.

03.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

03.01 Prepare television set for a planned production.
03.02 Draw and design a set plan to scale.
03.03 Select and arrange stage props.
03.04 Utilize hand tools to construct scene components.
03.05 Inspect and repair scenery as needed.

04.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

04.01 Describe types of lighting fixtures.
04.02 Identify parts of lighting fixtures.
04.03 Perform special effects lighting.
04.04 Set-up appropriate lighting for a production.
04.05 Describe functions of master lighting panel and dimmer board.
04.06 Operate master lighting panel to dimmer board.
04.07 Analyze lighting needs for production.

05.0 DEMONSTRATE CORRECT USE OF BASIC EQUIPMENT USED IN TELEVISION PRODUCTION--The student will be able to:

05.01 Load, record and play a video tape.
05.02 Demonstrate the steps necessary to set up, turn on and operate a video camera.
05.03 Demonstrate picture composition.
05.04 Identify, select and demonstrate use of an appropriate microphone.
05.05 Identify the qualities of a good audio track.
05.06 Demonstrate basic television lighting.

05.07 Explain the care, storage and use of television hardware and software.

06.0 DEMONSTRATE ABILITY TO IDENTIFY DIFFERENT TYPES OF SCRIPT COPY--The student will be able to:

06.01 Identify scripts by format.
06.02 Define terminology used in broadcast scriptwriting.

07.0 DEMONSTRATE ABILITY TO WRITE SCRIPT IN BROADCAST STYLE--The student will be able to:

07.01 Plan and produce a storyboard.
07.02 Specify steps leading to broadcast scripts.
07.03 Write broadcast scripts.

8.0 EXHIBIT A KNOWLEDGE OF THE TELEVISION PRODUCTION TEAM--The student will be able to:

08.01 List the job functions of the television production team.
08.02 Describe the steps of the production process.
08.03 Demonstrate ability to give and follow directions.
08.04 Demonstrate ability to function as a member of the production team.

09.0 EXHIBIT ABILITY TO APPLY SKILLS THROUGH PLANNING, WRITING, DIRECTING, EDITING AND RECORDING A TELEVISION PROGRAM.--The student will be able to:

09.01 Plan a television program.
09.02 Write a television program.
09.03 Direct a television program.
09.04 Edit a television program.
09.05 Record a television program.

10.0 PERFORM VIDEO TAPE RECORDING AND EDITING OPERATIONS--The student will be able to:

10.01 Identify and describe different video tape machines.
10.02 Describe operational parts of a video tape machine.
10.03 Operate video tape machine to record and playback.
10.04 Describe operational parts of a video cassette editor.
10.05 Perform assemble edits.
10.06 Perform insert edits.
10.07 Set-up video tape machines.
10.08 Set-up video cassette editor.

11.0 PERFORM TELEVISION PRODUCTION AND PROGRAMMING ACTIVITIES--The student will be able to:

11.01 Operate master switcher.
11.02 Operate routing switcher for production and tape dubs.
11.03 Set-up machines and tuner for in-house playback.
11.04 Compute broadcast math.
11.05 Develop script for a program.
11.06 Draw story board for a planned production.
11.07 Direct participants in production of a program.
11.08 Perform on-camera.

12.0 PERFORM CHARACTER GENERATOR AND SPECIAL EFFECTS GENERATOR FUNCTIONS--The student will be able to:

12.01 Describe operational parts of character generator.
12.02 Set-up character generator.
12.03 Describe inputs of special effects generator.
12.04 Operate special effects generator during production.
12.05 Operate character generator during production.

13.0 OPERATE TELEVISION STUDIO AUDIO CONTROL SYSTEM--The student will be able to:

13.01 Identify and select microphones for production.
13.02 Place microphones for maximum effect.
13.03 Describe parts of cartridge machine.
13.04 Set-up cartridge machine for production.
13.05 Operate cartridge machine during recording and playback.
13.06 Describe parts of reel-to-reel tape machine.
13.07 Set-up reel-to-reel tape and cassette tape machines for production.
13.08 Operate reel-to-reel tape and cassette tape machines for production.
13.09 Describe parts of a turntable.
13.10 Operate turntable for production.
13.11 Describe parts of an audio mixing console.
13.12 Operate audio mixing console.

14.0 PERFORM ELECTRONIC NEWS GATHERING (ENG) AND ELECTRONIC FIELD PRODUCTION(EFP) EQUIPMENT FUNCTIONS--The student will be able to:

14.01 Describe ENG and EFP port-a-pac components.
14.02 Set up port-a-pac for field production.
14.03 Operate port-a-pac during production segments.

15.0 PERFORM ROUTINE OPERATOR PREVENTATIVE MAINTENANCE OPERATIONS--The student will be able to:

15.01 Describe types of video connectors.
15.02 Describe types of audio connectors.
15.03 Assemble audio and video cables.
15.04 Operate soldering equipment.
15.05 Clean tape heads on audio recording equipment.
15.06 Clean tape heads on video recording equipment.
15.07 Replace broken knobs.
15.08 Replace sliders and potentiometers.
15.09 Troubleshoot a bad cable connection.
15.10 Replace headshell/cartridge and balance tone arm.
15.11 Adjust turntable speed as needed.
15.12 Solder 1/4", RCA, miniature, and XLR connectors.
15.13 Strip cable for soldering.
15.14 Replace bulb in light fixture.

16.0 WRITE, PRODUCE, DIRECT AND EDIT A VARIETY OF TELEVISION PROGRAMMING--The student will be able to:

16.01 Write, produce, direct and edit a news program.
16.02 Write, produce, direct and edit an editorial.
16.03 Write, produce, direct and edit a feature program.
16.04 Write, produce, direct and edit an interview program.
16.05 Write, produce, direct and edit a commercial.

17.0 DEMONSTRATE ABILITY IN STUDIO PRODUCTION REGARDING THE SELECTION AND QUALITY OF PRODUCTION TOPICS, USE OF APPROPRIATE EQUIPMENT AND ADHERENCE TO PRODUCTION DEADLINES--The student will be able to:

17.01 Demonstrate skills in selecting production topics.
17.02 Select appropriate equipment.
17.03 Set and adhere to production deadlines.

18.0 UNDERSTAND CAREER OPPORTUNITIES IN THE TELEVISION INDUSTRY--The student will be able to:

18.01 Identify a career objective.
18.02 Identify sources of information concerning careers.
18.03 List the skills, attitudes, abilities and training required for jobs in the television industry.
18.04 List the rapid changes occurring in the television industry.
18.05 Describe employment opportunities in television related careers.
18.06 Explain the importance of updating occupational skills and knowledge through continued education and training.

19.0 DEMONSTRATE AN INDEPENDENT LEVEL OF PROFICIENCY IN ONE OR MORE AREAS OF TELEVISION PRODUCTION--The student will be able to:

19.01 Perform at an independent level of proficiency in area(s) of specialization.

20.0 DEMONSTRATE AN ABILITY TO SPECIALIZE IN ONE OR MORE AREAS OF TELEVISION PRODUCTION--The student will be able to:

20.01 Survey and select area(s) for specialization in television production.

21.0 TRANSLATE A WRITTEN SCRIPT INTO A FULL TELEVISION PRODUCTION--The student will be able to:

21.01 Produce a television program from a written script.

22.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

22.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
22.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
22.03 Read and follow written and oral instructions.
22.04 Answer and ask questions coherently and concisely.
22.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
22.06 Demonstrate appropriate telephone/communication skills.

23.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

23.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
23.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
23.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
23.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
23.05 Demonstrate an understanding of federal, state and local taxes and their computation.

24.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

24.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
24.02 Draw conclusions or make inferences from data.
24.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
24.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

25.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

25.01 Conduct a job search.
25.02 Secure information about a job.
25.03 Identify documents which may be required when applying for a job interview.
25.04 Complete a job application form correctly.
25.05 Demonstrate competence in job interview techniques.
25.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
25.07 Identify acceptable work habits.
25.08 Demonstrate knowledge of how to make job changes appropriately.
25.09 Demonstrate acceptable employee health habits.
25.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes, Chapter 442.

26.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

26.01 Define entrepreneurship.
26.02 Describe the importance of entrepreneurship to the American economy.
26.03 List the advantages and disadvantages of business ownership.
26.04 Identify the risks involved in ownership of a business.
26.05 Identify the necessary personal characteristics of a successful entrepreneur.
26.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial Education
PROGRAM TITLE: Basic Television Production
COURSE TITLE: Basic Television Production 1

EFFECTIVE DATE: July, 1993
COURSE CREDIT: 1
PROGRAM NUMBER: 877210
COURSE NUMBER: 8772110

01.0 EXHIBIT KNOWLEDGE OF THE HISTORY OF TELEVISION AND ITS ROLE IN THE MASS MEDIA--The student will be able to:

01.01 Describe the pre-electronic mass communication processes.
01.02 Describe the growth of communication to include the telegraph, the wireless, early radio and television.
01.03 Describe the development of networks and their impact on broadcasting.
01.04 Describe the social and political impact of television.
01.05 Discuss recent technological developments and the future of telecommunications.
01.06 Discuss recent programming developments and the future of telecommunications.

02.0 DEMONSTRATE KNOWLEDGE OF THE TELEVISION PRODUCTION TECHNOLOGY PROGRAM INSTRUCTIONAL SYSTEM, SAFETY PROCEDURES AND TRADE TERMINOLOGY--The student will be able to:

02.01 Describe the operating system of the vocational program.
02.02 State and apply general safety rules for operation of equipment and learning activities in the lab.
02.03 Utilize trade terminology in the television production lab.
02.04 Utilize trade abbreviations and acronyms as appropriate.
02.05 Transport equipment safely and securely.
02.06 Store equipment in appropriate locations.

03.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

03.01 Prepare television set for a planned production.
03.02 Draw and design a set plan to scale.
03.03 Select and arrange state props.
03.04 Utilize hand tools to construct scene components.
03.05 Inspect and repair scenery as needed.

04.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

04.01 Describe types of lighting fixtures.
04.02 Identify parts of lighting fixtures.
04.03 Perform special effects lighting.
04.04 Set-up appropriate lighting for a production.
04.05 Describe functions of master lighting panel and dimmer board.
04.06 Operate master lighting panel to dimmer board.
04.07 Analyze lighting needs for production.

05.0 DEMONSTRATE CORRECT USE OF BASIC EQUIPMENT USED IN TELEVISION PRODUCTION--The student will be able to:

05.01 Load, record and play a video tape.
05.02 Demonstrate the steps necessary to set up, turn on and operate a video camera.
05.03 Demonstrate picture composition.
05.04 Identify, select and demonstrate use of an appropriate microphone.

05.05 Identify the qualities of a good audio track.
05.06 Demonstrate basic television lighting.
05.07 Explain the care, storage and use of television hardware and software.

06.0 DEMONSTRATE ABILITY TO IDENTIFY DIFFERENT TYPES OF SCRIPT COPY--The student will be able to:

06.01 Identify scripts by format.
06.02 Define terminology used in broadcast scriptwriting.

07.0 DEMONSTRATE ABILITY TO WRITE SCRIPT IN BROADCAST STYLE--The student will be able to:

07.01 Plan and produce a storyboard.
07.02 Specify steps leading to broadcast scripts.
07.03 Write broadcast scripts.

8.0 EXHIBIT A KNOWLEDGE OF THE TELEVISION PRODUCTION TEAM--The student will be able to:

08.01 List the job functions of the television production team.
08.02 Describe the steps of the production process.
08.03 Demonstrate ability to give and follow directions.
08.04 Demonstrate ability to function as a member of the production team.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Basic Television Production
PROGRAM NUMBER: 8772100
COURSE TITLE: Basic Television Production 2
COURSE NUMBER: 8772120
COURSE DESCRIPTION:

09.0 EXHIBIT ABILITY TO APPLY SKILLS THROUGH PLANNING, WRITING, DIRECTING, EDITING AND RECORDING A TELEVISION PROGRAM.--The student will be able to:

09.01 Plan a television program.
09.02 Write a television program.
09.03 Direct a television program.
09.04 Edit a television program.
09.05 Record a television program.

10.0 PERFORM VIDEO TAPE RECORDING AND EDITING OPERATIONS--The student will be able to:

10.01 Identify and describe different video tape machines.
10.02 Describe operational parts of a video tape machine.
10.03 Operate video tape machine to record and playback.
10.04 Describe operational parts of a video cassette editor.
10.05 Perform assemble edits.
10.06 Perform insert edits.
10.07 Set-up video tape machines.
10.08 Set-up video cassette editor.

11.0 PERFORM TELEVISION PRODUCTION AND PROGRAMMING ACTIVITIES--The student will be able to:

11.01 Operate master switcher.
11.02 Operate routing switcher for production and tape dubs.
11.03 Set-up machines and tuner for in-house playback.
11.04 Compute broadcast math.
11.05 Develop script for a program.
11.06 Draw story board for a planned production.
11.07 Direct participants in production of a program.
11.08 Perform on-camera.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　COURSE CREDIT: 1

PROGRAM TITLE: Basic Television Production　　PROGRAM NUMBER: 8772100

COURSE TITLE: Basic Television Production 3　　COURSE NUMBER: 8772130

COURSE DESCRIPTION:

12.0 PERFORM CHARACTER GENERATOR AND SPECIAL EFFECTS GENERATOR FUNCTIONS--The student will be able to:

12.01 Describe operational parts of character generator.
12.02 Set-up character generator.
12.03 Describe inputs of special effects generator.
12.04 Operate special effects generator during production.
12.05 Operate character generator during production.

13.0 OPERATE TELEVISION STUDIO AUDIO CONTROL SYSTEM--The student will be able to:

13.01 Identify and select microphones for production.
13.02 Place microphones for maximum effect.
13.03 Describe parts of cartridge machine.
13.04 Set-up cartridge machine for production.
13.05 Operate cartridge machine during recording and playback.
13.06 Describe parts of reel-to-reel tape machine.
13.07 Set-up reel-to-reel tape and cassette tape machines for production.
13.08 Operate reel-to-reel tape and cassette tape machines for production.
13.09 Describe parts of a turntable.
13.10 Operate turntable for production.
13.11 Describe parts of an audio mixing console.
13.12 Operate audio mixing console.

14.0 PERFORM ELECTRONIC NEWS GATHERING (ENG) AND ELECTRONIC FIELD PRODUCTION(EFP) EQUIPMENT FUNCTIONS--The student will be able to:

14.01 Describe ENG and EFP port-a-pac components.
14.02 Set up port-a-pac for field production.
14.03 Operate port-a-pac during production segments.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Television Production

PROGRAM NUMBER: 8772100

COURSE TITLE: Basic Television Production 4

COURSE NUMBER: 8772140

15.0 PERFORM ROUTINE OPERATOR PREVENTATIVE MAINTENANCE OPERATIONS--The student will be able to:

15.01 Describe types of video connectors.
15.02 Describe types of audio connectors.
15.03 Assemble audio and video cables.
15.04 Operate soldering equipment.
15.05 Clean tape heads on audio recording equipment.
15.06 Clean tape heads on video recording equipment.
15.07 Replace broken knobs.
15.08 Replace sliders and potentiometers.
15.09 Troubleshoot bad cable connection.
15.10 Replace headshell/cartridge and balance tone arm.
15.11 Adjust turntable speed as needed.
15.12 Solder 1/4", RCA, miniature, and XLR connectors.
15.13 Strip cable for soldering.
15.14 Replace bulb in light fixture.

16.0 WRITE, PRODUCE, DIRECT AND EDIT A VARIETY OF TELEVISION PROGRAMMING--The student will be able to:

16.01 Write, produce, direct and edit a news program.
16.02 Write, produce, direct and edit an editorial.
16.03 Write, produce, direct and edit a feature program.
16.04 Write, produce, direct and edit an interview program.
16.05 Write, produce, direct and edit a commercial.

17.0 DEMONSTRATE ABILITY IN STUDIO PRODUCTION REGARDING THE SELECTION AND QUALITY OF PRODUCTION TOPICS, USE OF APPROPRIATE EQUIPMENT AND ADHERENCE TO PRODUCTION DEADLINES--The student will be able to:

17.01 Demonstrate skills in selecting production topics.
17.02 Select appropriate equipment.
17.03 Set and adhere to production deadlines.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Television Production

PROGRAM NUMBER: 8772100

COURSE TITLE: Basic Television Production 5

COURSE NUMBER: 8772150

18.0 UNDERSTAND CAREER OPPORTUNITIES IN THE TELEVISION INDUSTRY--The student will be able to:

18.01 Identify a career objective.
18.02 Identify sources of information concerning careers.
18.03 List the skills, attitudes, abilities and training required for jobs in the television industry.
18.04 List the rapid changes occurring in the television industry.
18.05 Describe employment opportunities in television related careers.
18.06 Explain the importance of updating occupational skills and knowledge through continued education and training.

19.0 DEMONSTRATE AN INDEPENDENT LEVEL OF PROFICIENCY IN ONE OR MORE AREAS OF TELEVISION PRODUCTION--The student will be able to:

19.01 Perform at an independent level of proficiency in area(s) of specialization.

20.0 DEMONSTRATE AN ABILITY TO SPECIALIZE IN ONE OR MORE AREAS OF TELEVISION PRODUCTION--The student will be able to:

20.01 Survey and select area(s) for specialization in television production.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Basic Television Production PROGRAM NUMBER: 8772100

COURSE TITLE: Basic Television Production 6 COURSE NUMBER: 8772160

21.0 TRANSLATE A WRITTEN SCRIPT INTO A FULL TELEVISION PRODUCTION--The student will be able to:

21.01 Produce a television program from a written script.

22.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

22.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
22.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
22.03 Read and follow written and oral instructions.
22.04 Answer and ask questions coherently and concisely.
22.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
22.06 Demonstrate appropriate telephone/communication skills.

23.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

23.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
23.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
23.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
23.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
23.05 Demonstrate an understanding of federal, state and local taxes and their computation.

24.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

24.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
24.02 Draw conclusions or make inferences from data.
24.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
24.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

25.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

25.01 Conduct a job search.
25.02 Secure information about a job.
25.03 Identify documents which may be required when applying for a job interview.
25.04 Complete a job application form correctly.
25.05 Demonstrate competence in job interview techniques.
25.06 Identify or demonstrate appropriate responses to criticism from

employer, supervisor or other employees.

25.07 Identify acceptable work habits.
25.08 Demonstrate knowledge of how to make job changes appropriately.
25.09 Demonstrate acceptable employee health habits.
25.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes, Chapter 442.

26.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

26.01 Define entrepreneurship.
26.02 Describe the importance of entrepreneurship to the American economy.
26.03 List the advantages and disadvantages of business ownership.
26.04 Identify the risks involved in ownership of a business.
26.05 Identify the necessary personal characteristics of a successful entrepreneur.
26.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing

CODE NUMBER: Secondary 8775000　　Postsecondary ______

Florida CIP 0648.030302

SECONDARY SCHOOL CREDITS 6　　COLLEGE CREDITS ______　　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9　x 9-12　____Postsecondary Adult Vocational

______ Postsecondary Vocational　x Other 30, 31

CERTIFICATION COVERAGE: FURN REPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as upholsterers (89508698), or upholstery helpers, (780.687-054).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, preparation of furniture for reupholstering, making patterns and coverings and trimming upholstered items.

Listed below are the courses that comprise this program when offered at the secondary level:

8775010	Basic Upholstery and Furniture Refinishing 1
8775020	Basic Upholstery and Furniture Refinishing 2
8775030	Basic Upholstery and Furniture Refinishing 3
8775040	Basic Upholstery and Furniture Refinishing 4
8775050	Basic Upholstery and Furniture Refinishing 5
8775060	Basic Upholstery and Furniture Refinishing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of power machines and hand tools in cutting, sewing, and re-upholstering activities.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Use trade skills.
02. Maintain and operate power machines.
03. Use upholstery skills.
04. Perform management skills.
05. Make and use patterns.
06. Prepare furniture for reupholstering.
07. Reupholster simple upholstered items.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: 8775000

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing
POSTSECONDARY NUMBER:

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 se upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.
01.05 Understand and demonstrate proper safety precautions when using upholstery tools and machinery.

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Reconstruct deck with coil springs.
03.02 Reconstruct deck with zig-zag springs.
03.03 Reconstruct deck with rubber webbing.
03.04 Construct standard back.
03.05 Construct a loose pillow back.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

04.01 Estimate cost and completion time.
04.02 Complete a work order.
04.03 Perform shop foreman duties.
04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

05.01 Estimate fabric needed for final cover.
05.02 Mark pattern on fabric.
05.03 Cut out marked fabric.

06.0 PREPARE FURNITURE FOR REUPHOLSTERING--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.

07.0 REUPHOLSTER SIMPLE UPHOLSTERED ITEMS--The student will be able to:

07.01 Cover inside arms and/or wings.
07.02 Cover outside arms and/or wings.
07.03 Cover outside backs.
07.04 Construct a ruffled skirt.
07.05 Construct a pleated skirt.
07.06 Construct a lined-tailored skirt.

07.07 Attach cambric.
07.08 Construct a box cushion cover.
07.09 Construct a "T" cushion cover.
07.10 Construct a knife edge cushion cover.
07.11 Construct a pleated cushion cover.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be

able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing

PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 1

COURSE NUMBER: 8775010

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in trade and employability skills.

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 Use upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.
01.05 Understand and demonstrate proper safety precautions when using upholstery tools and machinery.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.

12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing

PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 2

COURSE NUMBER: 8775020

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in operating and maintaining power machines.

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing

PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 3

COURSE NUMBER: 8775030

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in upholstery skills.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Reconstruct deck with coil springs.
03.02 Reconstruct deck with zig-zag springs.
03.03 Reconstruct deck with rubber webbing.
03.04 Construct standard back.
03.05 Construct a loose pillow back.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing
PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 4
COURSE NUMBER: 8775040

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in management and pattern skills.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

- 04.01 Estimate cost and completion time.
- 04.02 Complete a work order.
- 04.03 Perform shop foreman duties.
- 04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

- 05.01 Estimate fabric needed for final cover.
- 05.02 Mark pattern on fabric.
- 05.03 Cut out marked fabric.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

- 09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
- 09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
- 09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
- 09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing
PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 5
COURSE NUMBER: 8775050

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in constructing furniture foundations.

06.0 PREPARE FURNITURE FOR REUPHOLSTERING--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery and Furniture Refinishing

PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery and Furniture Refinishing 6

COURSE NUMBER: 8775060

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in constructing cushion and wood furniture touch-up and repair.

07.0 REUPHOLSTER SIMPLE UPHOLSTERED ITEMS--The student will be able to:

07.01 Cover inside arms and/or wings.
07.02 Cover outside arms and/or wings.
07.03 Cover outside backs.
07.04 Construct a ruffled skirt.
07.05 Construct a pleated skirt.
07.06 Construct a lined-tailored skirt.
07.07 Attach cambric.
07.08 Construct a box cushion cover.
07.09 Construct a "T" cushion cover.
07.10 Construct a knife edge cushion cover.
07.11 Construct a pleated cushion cover.

CURRICULUM FRAMEWORK　　　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Basic Welding

CODE NUMBER: Secondary 8754200　　　　Postsecondary ______

Florida CIP 0648.052800

SECONDARY SCHOOL CREDITS 6　　COLLEGE CREDITS ______　　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9　x 9-12　____ Postsecondary Adult Vocational

______ Postsecondary Vocational　x Other 30, 31

CERTIFICATION COVERAGE: WELDING @ 7 G　METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welding machine setter/operators (91702758), or welder helpers (819.687-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, reading blueprints, identifying metals, basic shop skills, gas welding skills, shielded metal arc welding skills, and shielded gas arc welding skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8754210	Basic Welding 1
8754220	Basic Welding 2
8754230	Basic Welding 3
8754240	Basic Welding 4
8754250	Basic Welding 5
8754260	Basic Welding 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in blueprint reading, gas welding, shielded metal arc welding and shielded gas arc welding.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic shop skills.
02. Read blueprints.
03. Identify metals.
04. Apply gas welding skills.
05. Apply shielded metal arc welding skills (SMAW).
06. Apply gas tungsten arc welding skills (GTAW).
07. Apply gas metal arc welding skills (GMAW).
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial

PROGRAM TITLE: Basic Welding

EFFECTIVE DATE: July, 1993

SECONDARY NUMBER: 8754200

POSTSECONDARY NUMBER: ______

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret welding symbols
02.02 Interpret detail drawings.
02.03 List materials for fabrication from blueprint.
02.04 Develop shop drawings.
02.05 Develop sketching skills.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify materials by spark test.
03.03 Classify metals by magnetic properties.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Identify safety and set-up procedures.
04.02 Set up oxy-fuel equipment.
04.03 Cut carbon steel using oxy-fuel equipment.
04.04 Run beads with gas welding equipment.
04.05 Gas weld carbon steel joints.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Identify safety and set-up procedures.
05.02 Identify and select proper electrodes.
05.03 Set up SMAW equipment.
05.04 Run beads with SMAW equipment.
05.05 Apply surfacing skills.
05.06 Weld single pass and multiple pass lap joints in all positions.
05.07 Weld outside corner joints in all positions.
05.08 Weld multiple pass "tee" joints in all positions.
05.09 Run beads with stainless steel electrodes.

06.0 APPLY SHIELDED GAS TUNGSTEN ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Identify safety and set up procedures.
06.02 Assemble and set up GTAW equipment (TIG).
06.03 Run beads with GTAW equipment.
06.04 Weld aluminum joints with GTAW equipment.
06.05 Weld mild steel joints with GTAW equipment.
06.06 Weld stainless steel joints with GTAW equipment.

06.07 Weld aluminum with MIG equipment.
06.08 Run beads with submerged arc welding equipment.
06.09 Weld Aluminum with GMAW equipment

07.0 APPLY GAS METAL ARC WELDING SKILLS (GMAW)--The student will be able to:

07.01 Identify safety and set-up procedures.
07.02 Assemble and set up GMAW equipment.
07.03 Run beads with GMAW equipment (MIG).
07.04 Weld mild steel joints with GMAW equipment.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.

11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200
COURSE TITLE: Basic Welding 1
COURSE NUMBER: 8754210

COURSE DESCRIPTION:

This course is designed to provide instruction of safety rules and regulations concerning tool, equipment, and class procedures, the use of welding practices and equipment, cutting bending, drilling and finishing of metal, measuring skills, communication and leadership skills as they apply to the welding industries.

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200
COURSE TITLE: Basic Welding 2
COURSE NUMBER: 8754220

COURSE DESCRIPTION:

This course is designed to provide instruction in the interpretation of detail drawings and how they apply to welding, determine types of metals needed, develop shop drawings of desired work, identify and classify metals by appearance, weight, spark testing and magnetic properties.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret welding symbols.
02.02 Interpret detail drawings.

02.03 List materials for fabrication from blueprint.
02.04 Develop shop drawings.
02.05 Develop sketching skills.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify materials by spark test.
03.03 Classify metals by magnetic properties.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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STUDENT PERFORMANCE STANDARDS

		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Welding	PROGRAM NUMBER:	8754200
COURSE TITLE:	Basic Welding 3	COURSE NUMBER:	8754230

COURSE DESCRIPTION:

This course is designed to provide instruction in the safe set up and use of oxy-fuel equipment to cut carbon steel, run beads and weld carbon steel joints.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Identify safety and set-up procedures.
04.02 Set up oxy-fuel equipment.
04.03 Cut carbon steel using oxy-fuel equipment.
04.04 Run beads with gas welding equipment.
04.05 Gas weld carbon steel joints.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Welding

PROGRAM NUMBER: 8754200

COURSE TITLE: Basic Welding 4

COURSE NUMBER: 8754240

COURSE DESCRIPTION:

This course is designed to provide instruction in the use of shielded metal arc welding equipment, surfacing skills, welding single and multiple pass lap joints, welding of outside corners, and multiple pass "tee" joints in all positions.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Identify safety and set-up procedures.
05.02 Identify and select proper electrodes.
05.03 Set-up SMAW equipment.
05.04 Run beads with SMAW equipment.
05.05 Apply surfacing skills.
05.06 Weld single pass and multiple pass lap joints.
05.07 Weld outside corner joints.
05.08 Weld multiple pass "tee" joints in all positions.
05.09 Run beads with stainless steel electrodes.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Welding

PROGRAM NUMBER: 8754200

COURSE TITLE: Basic Welding 5

COURSE NUMBER: 8754250

COURSE DESCRIPTION:

This course is designed to provide instruction in the safe set up and use of GTAW (TIG) equipment for running beads, welding aluminum, mild steel and stainless steel joints, safely use GMAW (MIG) equipment to run beads and weld mile steel joints.

06.0 APPLY SHIELDED GAS TUNGSTEN ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Identify safety and set-up procedures.
06.02 Assemble and set-up GTAW equipment (TIG).
06.03 Run beads with GTAW equipment.
06.04 Weld aluminum joints with GTAW equipment.
06.05 Weld mild steel joints with GTAW equipment.
06.06 Weld stainless steel joints with GTAW equipment.
06.07 Weld aluminum with MIG equipment.
06.08 Run beads with submerged arc welding equipment.
06.09 Weld Aluminum with GMAW equipment.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial

PROGRAM TITLE: Basic Welding

COURSE TITLE: Basic Welding 6

EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1

PROGRAM NUMBER: 8754200

COURSE NUMBER: 8754260

COURSE DESCRIPTION:

This course is designed to provide instruction in the practical application of the various welding skills and practices developed in the previous five courses and employability skills.

07.0 APPLY GAS METAL ARC WELDING SKILLS (GMAW)--The student will be able to:

07.01 Identify safety and set-up procedures.
07.02 Assemble and set-up GMAW equipment.
07.03 Run beads with GMAW equipment (MIG).
07.04 Weld mild steel joints with GMAW equipment.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Biomedical Equipment Engineering Technology

CODE NUMBER: Secondary _________ Postsecondary_________

Florida CIP 0615.040101

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS X POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

X Postsecondary Vocational Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: This program is designed to prepare students for employment as electromedical and biomedical repair technicians (85908644), biomedical equipment engineering technicians, or in related occupations in electronics. This program also provides supplemental training to persons previously or currently employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program. The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

This specialization content includes, but is not limited to, repair of hydraulic and pneumatic systems, optical systems, treatment and diagnostic devices, monitoring equipment, electrosurgical generators and operation of testers and analyzers.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing electronic circuitry.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills. The computational skills should include algebra and trigonometry.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other. Biomedical Equipment

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in troubleshooting and repairing mechanical systems.
02. Troubleshoot, service, align and repair feedback systems.
03. Troubleshoot, service and repair hydraulic and pneumatic systems.
04. Troubleshoot, service and repair optical systems.
05. Troubleshoot, service and repair treatment devices.
06. Troubleshoot, service and repair diagnostic devices.
07. Troubleshoot, service and repair monitoring devices.
08. Operate testers and analyzers.
09. Demonstrate an understanding of the theory of biomedical hydraulic and pneumatic systems.
10. Demonstrate an understanding of theory of optical systems for biomedical applications.
11. Demonstrate an understanding of theory of biomedical monitoring equipment.
12. Demonstrate an understanding of theory of electrosurgical generators and equipment.
13. Demonstrate an understanding of theory and application of diagnostic equipment.
14. Recognize and respond to electrical device hazards.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ____________

PROGRAM TITLE: Biomedical Equipment Engineering Technology POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN TROUBLESHOOTING AND REPAIRING MECHANICAL SYSTEMS--The student will be able to:

01.01 Analyze power transmission components (gears, belts, chains, couplings, clutches and screw systems).
01.02 Troubleshoot power transmission components.
01.03 Repair poor transmission components.
01.04 Align power transmission components.
01.05 Analyze bearings.
01.06 Troubleshoot bearings.
01.07 Repair bearings.
01.08 Apply lubrications specifications to mechanical systems.
01.09 Analyze linkages and levers.
01.10 Troubleshoot linkages and levers.
01.11 Repair linkages and levers.
01.12 Align linkages and levers.
01.13 Analyze cams.
01.14 Troubleshoot cams.
01.15 Repair cams.
01.16 Align cams.
01.17 Analyze materials to statics and material specifications.
01.18 Troubleshoot materials to statics and materials specifications.
01.19 Repair materials to statics and material specifications.
01.20 Analyze metals to heat treating specifications.
01.21 Troubleshoot metals to heat treating specifications.
01.22 Repair metals to heat treating specifications.

02.0 TROUBLESHOOT, SERVICE, ALIGN AND REPAIR FEEDBACK SYSTEMS--The student will be able to:

02.01 Analyze transducers.
02.02 Troubleshoot transducers.
02.03 Align transducers.
02.04 Analyze motor controls.
02.05 Troubleshoot motor controls.
02.06 Repair motor controls.
02.07 Align motor controls.
02.08 Analyze synchros and resolvers.
02.09 Troubleshoot synchros and resolvers.
02.10 Align synchros and resolvers.
02.11 Analyze pulse encoders.
02.12 Troubleshoot pulse encoders.
02.13 Align pulse encoders.
02.14 Analyze farrand scales.
02.15 Troubleshoot farrand scales.
02.16 Align farrand scales.

03.0 TROUBLESHOOT, SERVICE AND REPAIR HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

03.01 Clean components and systems.
03.02 Analyze pumps (positive and negative).
03.03 Troubleshoot pumps (positive and negative pressures).
03.04 Align pumps (positive and negative pressures).
03.05 Analyze control and metering devices.

03.06 Troubleshoot control and metering devices.
03.07 Repair control and metering devices.
03.08 Analyze electromechanical valves (directional and control).
03.09 Troubleshoot electromechanical valves (directional and control).
03.10 Repair electromechanical valves (directional and control).
03.11 Analyze valve actuators (solenoid, servo, flow-control).
03.12 Troubleshoot (solenoid, servo, flow-control).
03.13 Repair (solenoid, servo, flow-control).
03.14 Analyze linear and rotary actuators.
03.15 Troubleshoot linear and rotary actuators.
03.16 Repair linear and rotary actuators.
03.17 Analyze pressure and flow regulators.
03.18 Troubleshoot pressure and flow regulators.
03.19 Repair pressure and flow regulators.
03.20 Analyze hydraulic and pneumatic circuits and systems.
03.21 Troubleshoot hydraulic and pneumatic circuits and systems.
03.22 Repair hydraulic and pneumatic circuits and systems.
03.23 Analyze piping reservoirs and fittings.
03.24 Troubleshoot piping reservoirs and fittings.
03.25 Repair piping reservoirs and fittings.

04.0 TROUBLESHOOT, SERVICE AND REPAIR OPTICAL SYSTEMS-- The student will be able to:

04.01 Analyze optics systems.
04.02 Troubleshoot optics systems.
04.03 Repair optics systems.
04.04 Analyze laser detectors.
04.05 Troubleshoot laser detectors.
04.06 Repair laser detectors.
04.07 Set up and operate laser alignment equipment.
04.08 Set up and operate laser interferometers.

05.0 TROUBLESHOOT, SERVICE AND REPAIR TREATMENT DEVICES--The student will be able to:

05.01 Determine operational status of surgical lasers.
05.02 Troubleshoot surgical lasers.
05.03 Remove and replace surgical laser components.
05.04 Perform operating systems check and make minor adjustment of surgical lasers.
05.05 Determine operational status of dialysis machines.
05.06 Troubleshoot dialysis machines.
05.07 Remove and replace dialysis machines components.
05.08 Perform operating systems check and make minor adjustments of dialysis machines.
05.09 Determine operational status of diathermy machines.
05.10 Troubleshoot diathermy machines.
05.11 Remove and replace diathermy machine components.
05.12 Perform operating systems check and make minor adjustments of diathermy machines.
05.13 Determine operational status of anesthesealogic devices.
05.14 Troubleshoot anesthesialogic devices.
05.15 Remove and replace anesthesialogic devices components.
05.16 Perform operating systems check and make minor adjustments of anesthesialogic devices.
05.17 Determine operational status of infusion control devices.
05.18 Troubleshoot infusion control devices.
05.19 Remove and replace infusion control devices components.
05.20 Perform operational systems check and make minor adjustments of infusion control devices.
05.21 Determine operational status of pacemaker support equipment.

05.22 Troubleshoot pacemaker support equipment.
05.23 Remove and replace pacemaker support equipment components.
05.24 Perform operating systems check and make minor adjustments of pacemaker support equipment.
05.25 Determine operational status of respiration therapy devices.
05.26 Troubleshoot respiration therapy devices.
05.27 Remove and replace respiration therapy device components.
05.28 Perform operating systems check and make minor adjustments of respiratory therapy devices.
05.29 Determine operational status of surgical microscopes.
05.30 Troubleshoot surgical microscopes.
05.31 Remove and replace surgical microscope components.
05.32 Perform operating systems check and make minor adjustments of surgical microscopes.
05.33 Determine operational status of sterilizers (gas and EtO).
05.34 Troubleshoot sterilizer (gas and EtO) devices.
05.35 Remove and replace sterilizer (gas and EtO) components.
05.36 Perform operating systems check and make minor adjustments of gas and EtO sterilizers.
05.37 Determine operating status of defibrillators.
05.38 Remove and replace defibrillator components.
05.39 Perform operating systems check and make minor adjustments of defibrillator devices.
05.40 Determine operational status of electrosurgical devices.
05.41 Troubleshoot electrosurgical devices.
05.42 Remove and replace electrosurgical device components.
05.43 Perform operation systems check and make minor adjustments of electrosurgical devices.
05.44 Determine operational status of portable X-ray machines (single).
05.45 Troubleshoot portable X-ray machines (simple).
05.46 Remove and replace portable X-ray (simple) components.
05.47 Perform operation systems check and make minor adjustments of portable X-ray machines (simple).
05.48 Determine operational status of electrical bed stations.
05.49 Troubleshoot electrical bed stations.
05.50 Remove and replace electrical bed station components.
05.51 Perform operating systems check and make minor adjustments of electrical bed station.
05.52 Determine operational status of hyperthermia and hypothermia devices.
05.53 Troubleshoot hyperthermia and hypothermia devices.
05.54 Remove and replace hyperthermia and hypothermia devices components.
05.55 Perform operation systems check and make minor adjustment of hyper/hypothermia devices.
05.56 Determine operational status of radiant warmers.
05.57 Troubleshoot radiant warmers.
05.58 Remove and replace radiant warmer components.
05.59 Perform operating systems check and make minor adjustments of hyper-hypothermia devices.
05.60 Determine operational status of incubators.
05.61 Troubleshoot incubators.
05.62 Remove and replace incubator components.
05.63 Perform operating systems check and make minor adjustments of incubators.
05.64 Determine operational status of fetal monitors.
05.65 Troubleshoot fetal monitors.
05.66 Remove and replace fetal monitor components.
05.67 Perform operating systems check and make minor adjustments of fetal monitors.
05.68 Determine operational status of chun guns.
05.69 Troubleshoot chun guns.

05.70 Remove and replace chun gun components.
05.71 Perform operating systems check and make minor adjustments of chunguns.

06.0 TROUBLESHOOT, SERVICE AND REPAIR DIAGNOSTIC DEVICES--The student will be able to:

06.01 Determine the operating status of blood cell counters.
06.02 Troubleshoot blood cell counters.
06.03 Remove and replace blood cell counter components.
06.04 Perform operating systems check and make minor adjustments of blood cell counters.
06.05 Determine the operating status of centrifuge devices.
06.06 Troubleshoot centrifuge devices.
06.07 Remove and replace centrifuge device components.
06.08 Perform operating systems check and make minor adjustments of centrifuge devices.
06.09 Determine the operating status of nephelometry devices.
06.10 Troubleshoot nephelometry devices.
06.11 Remove and replace nephelometry device components.
06.12 Perform operating systems check and make minor adjustments of nephelometry devices.
06.13 Determine the operational status of automated chemistry analyzers.
06.14 Troubleshoot automated chemistry analyzers.
06.15 Remove and replace automated chemistry analyzer components.
06.16 Perform operation systems check and make minor adjustments of automated chemistry analyzers.
06.17 Determine the operational status of simple scintillation counters.
06.18 Troubleshoot simple scintillation counters.
06.19 Remove and replace scintillation counter components.
06.20 Perform operation systems check and make minor adjustments of simple scintillation counters.
06.21 Determine the operations status of audiometers.
06.22 Troubleshoot audiometers.
06.23 Remove and replace audiometer components.
06.24 Perform operation systems check and make minor adjustments of audiometers.
06.25 Determine the operational status of electrophoresis equipment.
06.26 Troubleshoot electrophoresis equipment.
06.27 Remove and replace electrophoresis equipment components.
06.28 Perform operating systems check and make minor adjustments of electrophoresis equipment.
06.29 Determine the operational status of blood gas analyzers.
06.30 Troubleshoot blood gas analyzers.
06.31 Remove and replace blood gas analyzer component.
06.32 Perform operating systems check and make minor adjustments of blood gas analyzers.
06.33 Determine the operational status of HPLC and gas chromatograph equipment.
06.34 Troubleshoot HPLC and gas chromatograph equipment.
06.35 Remove and replace HPLC and gas chromatograph equipment components.
06.36 Perform operating systems check and make minor adjustments of HPLC and gas chromatograph equipment.
06.37 Determine the operational status of refractometers.
06.38 Troubleshoot simple refractometers.
06.39 Remove and replace simple refractometers.
06.40 Perform operating systems check and make minor adjustments of refractometers.
06.41 Determine the operational status of spectrophotometers.
06.42 Troubleshoot spectrophotometers.
06.43 Remove and replace spectrophotometer components.

06.44 Perform operating systems check and make minor adjustments of spectrophotometers.
06.45 Determine the operational status of laboratory microscopes.
06.46 Troubleshoot laboratory microscopes.
06.47 Remove and replace laboratory microscope components.
06.48 Perform operating systems check and make minor adjustments of laboratory microscopes.
06.49 Determine operational status of EEG devices.
06.50 Troubleshoot EEG devices.
06.51 Remove and replace EEG device components.
06.52 Perform operating systems check and make minor adjustments of EEG devices.
06.53 Determine operational status of EMG devices.
06.54 Troubleshoot EMG devices.
06.55 Remove and replace EMG device components.
06.56 Perform operation systems check and make minor adjustments of EMG devices.
06.57 Determine operational status of ENG devices.
06.58 Troubleshoot ENG devices.
06.59 Remove and replace ENG device components.
06.60 Perform operating systems check and make minor adjustments of ENG devices.
06.61 Determine operational status of transcutaneous devices.
06.62 Troubleshoot transcutaneous devices.
06.63 Remove and replace transcutaneous device components.
06.64 Perform operating systems check and make minor adjustments of transcutaneous devices.

07.0 TROUBLESHOOT, SERVICE AND REPAIR MONITORING DEVICES--The student will be able to:

07.01 Determine the operational status of EKG devices.
07.02 Troubleshoot EKG devices.
07.03 Remove and replace EKG device and components.
07.04 Perform operating systems check and make minor adjustment of EKG devices.
07.05 Determine the operational status of pressure devices.
07.06 Troubleshoot pressure devices.
07.07 Remove and replace pressure device components.
07.08 Perform operating systems check and make minor adjustments of pressure devices.
07.09 Determine the operation status of temperature devices.
07.10 Troubleshoot temperature devices.
07.11 Remove and replace temperature device components.
07.12 Perform operating systems check and make minor adjustments of temperature devices.
07.13 Determine the operational status of respiration devices.
07.14 Troubleshoot respiration devices.
07.15 Remove and replace respiration device components.
07.16 Perform operating systems check and make minor adjustments of respiration devices.
07.17 Determine the operational status of fluid output devices.
07.18 Troubleshoot fluid output devices.
07.19 Remove and replace fluid output device components.
07.20 Perform operating systems check and make minor adjustments of fluid output devices.
07.21 Determine the operational status of holter monitors.
07.22 Troubleshoot holter monitors.
07.23 Remove and replace holter monitors device components.
07.24 Perform operating systems check and make minor adjustments of holter monitors.
07.25 Determine the operational status of telemetry systems.

07.26 Troubleshoot telemetry systems.
07.27 Remove and replace telemetry system components.
07.28 Perform operating systems check and make minor adjustments of telemetry systems.
07.29 Determine the operational status of doppler blood flow devices.
07.30 Troubleshoot doppler blood flow devices.
07.31 Remove and replace doppler blood flow device components.
07.32 Perform operating systems check and make minor adjustments of doppler blood flow devices.
07.33 Determine the operational status of in vivo pressure transducers.
07.34 Troubleshoot in vivo pressure transducers.
07.35 Remove and replace in vivo pressure transducer components.
07.36 Perform operating systems check and make minor adjustments of in vivo pressure transducers.
07.37 Determine the operational status of chart recorders.
07.38 Troubleshoot chart recorders.
07.39 Remove and replace chart recorder components.
07.40 Perform operating systems check and make minor adjustments.

08.0 OPERATE TESTERS AND ANALYZERS--The student will be able to:

08.01 Operate safety analyzer.
08.02 Operate defibrillator tester.
08.03 Operate electrosurgical analyzer.
08.04 Operate EKG simulator.
08.05 Operate pressure simulator.
08.06 Operate temperature simulator.

09.0 DEMONSTRATE AN UNDERSTANDING OF THE THEORY OF BIOMEDICAL HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

09.01 Analyze a hydraulic pump.
09.02 Troubleshoot a hydraulic pump.
09.03 Align a hydraulic pump.
09.04 Analyze repair metering devices.
09.05 Troubleshoot repair metering devices.
09.06 Align repair metering devices.
09.07 Analyze electromechanical valves and valve actuators.
09.08 Troubleshoot electromechanical valves and valve actuators.
09.09 Align and operate an electromechanical valve and valve actuator.
09.10 Analyze pressure and flow regulators.
09.11 Troubleshoot electromechanical valves and valve actuators.
09.12 Align and operate a pressure and flow regulator.
09.13 Design and layout hydraulic and pneumatic series and system.

10.0 DEMONSTRATE AN UNDERSTANDING OF THEORY OF OPTICAL SYSTEMS FOR BIOMEDICAL APPLICATIONS--The student will be able to:

10.01 Analyze an optical system for a biomedical application.
10.02 Troubleshoot an optical system for a biomedical application.
10.03 Repair and operate an optical system for a premedical application.
10.04 Analyze a laser system for a biomedical application.
10.05 Troubleshoot a laser system for a biomedical application.
10.06 Repair and operate a laser system for a biomedical application.
10.07 Describe an optical system as it applies to the biomedical field.
10.08 Describe a laser system as it applies to the biomedical field.

11.0 DEMONSTRATE AN UNDERSTANDING OF THEORY OF BIOMEDICAL MONITORING EQUIPMENT--The student will be able to:

11.01 Demonstrate an understanding of the theory of audio cardiac monitoring equipment.

11.02 Demonstrate an understanding of the theory of visual cardiac monitoring equipment.
11.03 Demonstrate an understanding of the theory of mechanical cardiac monitoring and recording equipment.
11.04 Demonstrate an understanding of the theory of visual and mechanical blood pressure monitoring equipment.
11.05 Demonstrate an understanding of the theory of fetal monitoring equipment.
11.06 Demonstrate an understanding of the theory for instrumentation used in monitoring brain activity.

12.0 DEMONSTRATE AN UNDERSTANDING OF THEORY OF ELECTROSURGICAL GENERATORS AND EQUIPMENT--The student will be able to:

12.01 Demonstrate an understanding of theory of electrosurgical generators and equipment.
12.02 Demonstrate an understanding of theory of electrosurgical cutting,cauterizing and coagulating scalpels and associated equipment.

13.0 DEMONSTRATE AN UNDERSTANDING OF THEORY AND APPLICATION OF DIAGNOSTIC EQUIPMENT--The student will be able to:

13.01 Demonstrate an understanding of the theory of x-ray equipment.
13.02 Demonstrate an understanding of the theory of ultrasound equipment.
13.03 Demonstrate an understanding of the theory of magnetic resonance equipment.
13.04 Demonstrate an understanding of theory of computerized axial tomographical equipment.

14.0 RECOGNIZE AND RESPOND TO ELECTRICAL DEVICE HAZARDS--The student will be able to:

14.01 Define electrical safety.
14.02 Describe physiological effects of macro and micro shock on the human body.
14.03 Describe hazards of micro shock.
14.04 Describe design considerations for reducing electrical hazards in medical environment.
14.05 Perform safety checks on electrical devices.
14.06 Maintain leakage records on electrical devices.
14.07 Recognize and correctly respond to radiation hazards.
14.08 Perform safety checks on radiation.
14.09 Recognize and correctly respond to biological hazards.
14.10 Recognize and correctly respond to chemical hazards.
14.11 Recognize and correctly respond to mechanical hazards.
14.12 Perform safety checks on mechanical devices.
14.13 Recognize and correctly respond to fluidic device hazards.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.

15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Identify characteristics of the American enterprise system.
19.02 Define inflation and deflation.
19.03 Illustrate the basic economic questions facing any society.
19.04 Determine the results of a change in demand or a change in supply.
19.05 List factors which contribute to economic growth.
19.06 Identify characteristics of different types of business ownership.
19.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Biomedical Equipment Technology

CODE NUMBER: Secondary ________ Postsecondary I150401

Florida CIP 0615.040100

SECONDARY CREDITS____ COLLEGE CREDITS ____ POSTSECONDARY ADULT SCHOOL VOCATIONAL CREDITS _X_

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 _X_ Postsecondary Adult Vocational

___ Postsecondary Vocational _X_Other 30, 31

CERTIFICATION COVERAGE: TEC MED @ 5 BIOMED EQ @ 7 G ¶PRAC NURSE @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electromedical and biomedical repair technicians (85908644), or biomedical equipment technicians (019.261-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to, hydraulics, pneumatics, optics and mechanics to troubleshoot, service and repair equipment commonly used for treatment, diagnosis and monitoring of patients in a medical environment.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. electronic, hydraulic, pneumatic and optical systems commonly found in treatment, diagnostic and monitoring devices.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is:

Mathematics 10.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in mechanics/micromechanics.
02. Demonstrate proficiency in sensor and feedback devices.
03. Demonstrate proficiency in hydraulic vacuum systems.
04. Demonstrate proficiency in repairing optical systems.
05. Demonstrate proficiency in repairing treatment devices.
06. Demonstrate proficiency in repairing diagnostic devices.
07. Demonstrate proficiency in repairing monitoring devices.
08. Operate testers and analyzers.
09. Demonstrate knowledge of biomedical equipment hazards.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER:

PROGRAM TITLE: Biomedical Equipment Technology
POSTSECONDARY NUMBER: I150401

01.0 DEMONSTRATE PROFICIENCY IN MECHANICS/MICROMECHANICS--The student will be able to:

01.01 Analyze, troubleshoot, repair and align power transmission components (gears, belts, chains, couplings, clutches and screw systems).
01.02 Analyze, troubleshoot, and repair bearings.
01.03 Apply lubrication specifications to mechanical systems.
01.04 Analyze, troubleshoot, repair, and align linkages and hoses.
01.05 Analyze, troubleshoot, repair, and align cams.
01.06 Analyze and troubleshoot materials to statics and material specifications.
01.07 Analyze, troubleshoot, and repair metals to heat treating specifications.
01.08 Clean components and systems.

02.0 DEMONSTRATE PROFICIENCY IN SENSOR AND FEEDBACK DEVICES--The student will be able to:

02.01 Analyze, troubleshoot and align transducers.
02.02 Analyze, troubleshoot, repair, and align motor controls.
02.03 Analyze, troubleshoot and align synchros and resolvers.
02.04 Analyze, troubleshoot and align pulse encoders.
02.05 Analyze, troubleshoot and align farrand scales.

03.0 DEMONSTRATE PROFICIENCY IN HYDRAULIC VACUUM SYSTEMS--The student will be able to:

03.01 Clean components and systems.
03.02 Analyze, troubleshoot, and align pumps (positive and negative pressures).
03.03 Analyze, troubleshoot, and repair control and metering devices.
03.04 Analyze, troubleshoot, and repair electromechanical valves (directional and control).
03.05 Analyze, troubleshoot, and repair valve actuators (solenoid, servo, flow-control).
03.06 Analyze, troubleshoot, and repair linear and rotary actuators.
03.07 Analyze, troubleshoot, and repair pressure and flow regulators.
03.08 Analyze and troubleshoot hydraulic and pneumatic circuits and systems.
03.09 Analyze, troubleshoot, and repair piping reservoirs and fittings.

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING OPTICAL SYSTEMS--The student will be able to:

04.01 Analyze, troubleshoot and repair optics systems.
04.02 Analyze, troubleshoot and repair laser detectors.
04.03 Set up and operate laser alignment equipment.
04.04 Set up and operate laser interferometers.

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING TREATMENT DEVICES--The student will be able to:

05.01 Troubleshoot and repair surgical lasers.

05.02 Perform operating systems check and make minor adjustments of surgical lasers.
05.03 Troubleshoot and repair dialysis machines.
05.04 Perform operating systems check and make minor adjustments of dialysis machines.
05.05 Troubleshoot and repair diathermy machines.
05.06 Perform operating systems check and make minor adjustments of diathermy machines.
05.07 Troubleshoot and repair anesthesialogic devices.
05.08 Perform operational systems check and make minor adjustments of anesthesialogic devices.
05.09 Troubleshoot and repair infusion control devices.
05.10 Perform operating systems check and make minor adjustments of infusion control devices.
05.11 Troubleshoot and repair pacemaker support equipment.
05.12 Perform operating systems check and make minor adjustments of pacemaker support equipment.
05.13 Troubleshoot and repair respiration therapy devices.
05.14 Perform operating systems check and make minor adjustments of respiration therapy devices.
05.15 Troubleshoot and repair surgical microscopes.
05.16 Perform operating systems check and make minor adjustments of surgical microscopes.
05.17 Troubleshoot and repair sterilizer (gas & EtO) devices.
05.18 Perform operating systems check and make minor adjustments of gas and EtO sterilizers.
05.19 Troubleshoot and repair defibrillators.
05.20 Perform operating systems check and make minor adjustments of defibrillator devices.
05.21 Troubleshoot and repair electrosurgical devices.
05.22 Perform operating systems check and make minor adjustments of electrosurgical devices.
05.23 Troubleshoot and repair portable X-ray machines (simple).
05.24 Perform operating systems check and make minor adjustments of portable X-ray machines (simple).
05.25 Troubleshoot and repair electrical bed stations.
05.26 Perform operating systems check and make minor adjustments of electrical bed stations.
05.27 Troubleshoot and repair hyperthermia and hypothermia devices.
05.28 Perform operating systems check and make minor adjustments of hyper/hypothermia devices.
05.29 Troubleshoot and repair radiant warmers.
05.30 Perform operating systems check and make minor adjustments of radiant warmers.
05.31 Troubleshoot and repair incubators.
05.32 Perform operating systems check and make minor adjustments of incubators.
05.33 Troubleshoot and repair fetal monitors.
05.34 Perform operating systems check and make minor adjustments of fetal monitors.
05.35 Troubleshoot and repair chun guns.
05.36 Perform operating systems check and make minor adjustments of chun guns.

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING DIAGNOSTIC DEVICES--The student will be able to:

06.01 Troubleshoot and repair blood cell counters.
06.02 Perform operating systems check and make minor adjustments of blood cell counters.
06.03 Troubleshoot and repair centrifuge devices.
06.04 Perform operating systems check and make minor adjustments of

centrifuge devices.
06.05 Troubleshoot and repair nephelometry devices.
06.06 Perform operating systems check and make minor adjustments of nephelometry devices.
06.07 Troubleshoot and repair automated chemistry analyzers.
06.08 Perform operating systems check and make minor adjustments of automated chemistry analyzers.
06.09 Troubleshoot and repair simple scintillation counters.
06.10 Perform operating systems check and make minor adjustments of simple scintillation counters.
06.11 Troubleshoot and repair audiometers.
06.12 Perform operating systems check and make minor adjustments of audiometers.
06.13 Troubleshoot and repair electrophoresis equipment.
06.14 Perform operating systems check and make minor adjustments of electrophoresis equipment.
06.15 Troubleshoot and repair blood gas analyzers.
06.16 Perform operating systems check and make minor adjustments of blood gas analyzers.
06.17 Troubleshoot and repair HPLC and gas chromatograph equipment.
06.18 Perform operating systems check and make minor adjustments of HPLC and gas chromatograph equipment.
06.19 Troubleshoot and repair simple refractometers.
06.20 Perform operating systems check and make minor adjustments of refractometers.
06.21 Troubleshoot and repair spectrophotometers.
06.22 Perform operating systems check and make minor adjustments of spectrophotometers.
06.23 Troubleshoot and repair laboratory microscopes.
06.24 Perform operating systems check and make minor adjustments of laboratory microscopes.
06.25 Troubleshoot and repair EEG devices.
06.26 Perform operating systems check and make minor adjustments of EEG devices.
06.27 Troubleshoot and repair EMG devices.
06.28 Perform operating systems check and make minor adjustments of EMG devices.
06.29 Troubleshoot and repair ENG devices.
06.30 Perform operating systems check and make minor adjustments of ENG devices.
06.31 Troubleshoot and repair transcutaneous devices.
06.32 Perform operating systems check and make minor adjustments of transcutaneous devices.

07.0 DEMONSTRATE PROFICIENCY IN REPAIRING MONITORING DEVICES--The student will be able to:

07.01 Troubleshoot and repair EKG devices.
07.02 Perform operating systems check and make minor adjustments of EKG devices.
07.03 Troubleshoot and repair pressure devices.
07.04 Perform operating systems check and make minor adjustments of pressure devices.
07.05 Troubleshoot and repair temperature devices.
07.06 Perform operating systems check and make minor adjustments of temperature devices.
07.07 Troubleshoot and repair respiration devices.
07.08 Perform operating systems check and make minor adjustments of respiration devices.
07.09 Troubleshoot and repair fluid output devices.
07.10 Perform operating systems check and make minor adjustments of fluid output devices.

07.11 Troubleshoot and repair holter monitors.
07.12 Perform operating systems check and make minor adjustments of holter monitors.
07.13 Troubleshoot and repair telemetry systems.
07.14 Perform operating systems check and make minor adjustments of telemetry systems.
07.15 Troubleshoot and repair doppler blood flow devices.
07.16 Perform operating systems check and make minor adjustments of doppler blood flow devices.
07.17 Troubleshoot and repair in vivo pressure transducers.
07.18 Perform operating systems check and make minor adjustments of in vivo pressure transducers.
07.19 Troubleshoot and repair chart recorders.
07.20 Perform operating systems check and make minor adjustments of chart recorders.

08.0 OPERATE TESTERS AND ANALYZERS--The student will be able to:

08.01 Operate safety analyzer.
08.02 Operate defibrillator tester.
08.03 Operate electrosurgical analyzer.
08.04 Operate EKG simulator.
08.05 Operate pressure simulator.
08.06 Operate temperature simulator.

09.0 DEMONSTRATE KNOWLEDGE OF BIOMEDICAL EQUIPMENT HAZARDS--The student will be able to:

09.01 Perform safety checks on electrical devices.
09.02 Maintain leakage records on electrical devices.
09.03 Recognize and correctly respond to radiation hazards.
09.04 Perform safety checks on radiation devices.
09.05 Recognize and correctly respond to biological hazards.
09.06 Recognize and correctly respond to chemical hazards.
09.07 Recognize and correctly respond to mechanical hazards.
09.08 Perform safety checks on mechanical devices.
09.09 Recognize and correctly respond to fluidics device hazards.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.

11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Identify characteristics of the American enterprise system.
14.02 Define inflation and deflation.
14.03 Illustrate the basic economic questions facing any society.
14.04 Determine the results of a change in demand or a change in supply.
14.05 List factors which contribute to economic growth.
14.06 Identify characteristics of different types of business ownership.
14.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Blueprint Reading and Estimation

CODE NUMBER: Secondary _______ Postsecondary I469919

Florida CIP 0646.999901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ___7-9 ____9-12 __x__Postsecondary Adult Vocational

_____ Postsecondary Vocational __x___ Other __30, 31__

CERTIFICATION COVERAGE: TEC CONSTR @ 7 G DRAFTING @ 7 G BLU PR RDG @ 7 G
CARPENTRY @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as blueprint readers, cost estimators (21902028), or to provide supplemental training for persons previously or currently employed in these occupations.

II. LABORATORY ACTIVITIES: Laboratory activities are offered on campus or as "in-plant" programs in business and on company premises.

III. SPECIAL NOTE: The length of this program/course varies with the needs of individual students. It is only offered as a component of a specialized program.

The Vocational Industrial Clubs of America, Inc, is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. When provided, these activities are considered an integral part of this program.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 150 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Maintain blueprints.
02. Prepare sketches.
03. Develop basic blueprint reading skills.
04. Interpret mechanical drawings.
05. Interpret architectural drawings.
06. Interpret structural drawings.
07. Interpret electronic drawings.

08. Interpret pneumatic/hydraulic drawings.
09. Interpret charts and graphs.
10. Interpret maps drawings.
11. Estimate materials and cost.
12. Identify codes and standards.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Blueprint Reading and Estimation POSTSECONDARY NUMBER: I469919

01.0 MAINTAIN BLUEPRINTS--The student will be able to:

01.01 Make a blueprint.
01.02 Maintain blueprints.

02.0 PREPARE SKETCHES--The student will be able to:

02.01 Use freehand techniques.
02.02 Prepare multi-view sketch drawings.
02.03 Prepare pictorial sketch drawings.

03.0 DEVELOP BASIC BLUEPRINT READING SKILLS--The student will be able to:

03.01 Apply math skills.
03.02 Read scales and measuring instruments.
03.03 Read and interpret multi-view drawings.
03.04 Read and interpret section views.
03.05 Read and interpret auxiliary views.
03.06 Read and interpret types of dimensions.
03.07 Read and interpret pictorial drawings.
03.08 Read and interpret supplementary information.

04.0 INTERPRET MECHANICAL DRAWINGS--The student will be able to:

04.01 Read and interpret removable fastener drawings.
04.02 Read and interpret welding drawings.
04.03 Read and interpret geometric tolerances.
04.04 Read and interpret cam drawings.
04.05 Read and interpret gear drawings.
04.06 Read and interpret assembly and sub-assembly drawings.
04.07 Read and interpret detail drawings.
04.08 Read and interpret surface developments.
04.09 Read and interpret bearing drawings.
04.10 Read and interpret spring drawings.
04.11 Read and interpret casting drawings.
04.12 Read and interpret forging drawings.
04.13 Read and interpret tool drawings.
04.14 Read and interpret stamping drawings.
04.15 Read and interpret numerical control drawings.
04.16 Read and interpret computer aided drawings.

05.0 INTERPRET ARCHITECTURAL DRAWINGS--The student will be able to:

05.01 Read and interpret plot plans.
05.02 Read and interpret foundation plan drawings.
05.03 Read and interpret floor plan drawings.
05.04 Read and interpret elevation drawings.
05.05 Read and interpret section views and details.
05.06 Read and interpret schedules.
05.07 Read and interpret stair details.
05.08 Read and interpret fireplace details.
05.09 Read and interpret truss drawings.
05.10 Read and interpret roof-framing plans.
05.11 Read and interpret electrical plans.
05.12 Read and interpret plumbing drawings.

05.13 Read and interpret heating/cooling plans.
05.14 Read and interpret landscape layout drawings.
05.15 Read and interpret specifications.

06.0 INTERPRET STRUCTURAL DRAWINGS--The student will be able to:

06.01 Read and interpret erection plans.
06.02 Read and interpret structural steel design drawings.
06.03 Read and interpret structural steel drawings.
06.04 Read and interpret concrete engineering drawings.
06.05 Read and interpret placing drawings.

07.0 INTERPRET ELECTRONIC DRAWINGS--The student will be able to:

07.01 Read and interpret schematic drawings.
07.02 Read and interpret printed circuit board drawings.
07.03 Read and interpret package drawings.
07.04 Read and interpret connection drawings.
07.05 Read and interpret interconnection drawings.
07.06 Read and interpret wiring lists.
07.07 Read and interpret cable drawings.
07.08 Read and interpret harness drawings.
07.09 Read and interpret component drawings.
07.10 Read and interpret logic diagrams.
07.11 Read and interpret block diagrams.

08.0 INTERPRET PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

08.01 Read and interpret pictorial diagrams.
08.02 Read and interpret cutaway diagrams.
08.03 Read and interpret graphical diagrams.
08.04 Read and interpret combination diagrams.

09.0 INTERPRET CHARTS AND GRAPHS--The student will be able to:

09.01 Read and interpret charts.
09.02 Read and interpret graphs.

10.0 INTERPRET MAP DRAWINGS--The student will be able to:

10.01 Read and interpret traverse drawings.
10.02 Read and interpret plat drawings.
10.03 Read and interpret street layout drawings.
10.04 Read and interpret map drawings.
10.05 Read and interpret topographic drawings.

11.0 ESTIMATE MATERIALS AND COSTS--The student will be able to:

11.01 Compile manufactured material take-offs.
11.02 Compile construction take-offs.
11.03 Compile mechanical equipment take-offs.
11.04 Compile electrical/electronic take-offs.
11.05 Compile labor costs.
11.06 Compile equipment costs.
11.07 Compile overhead costs.

12.0 IDENTIFY CODES AND STANDARDS--The student will be able to:

12.01 Identify construction codes and standards.
12.02 Identify mechanical standards.
12.03 Identify electronic standards.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.

17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Boat and Yacht Refinishing and Repair

CODE NUMBER: Secondary _______ Postsecondary I490316

Florida CIP 0649.030601

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: SEAMANSHIP @ 7 G CARPENTRY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as precision woodworkers (89399709) and boat patchers/plasterers or boat repairers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices as marine painter/refinisher, marine carpenter, marine mechanical systems technician or marine welder/fabricator. A program may be structured to emphasize one of the course areas but does not have to cover all areas comprehensively.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in manufacturing, fabrication, repair, painting and refinishing in a boatyard manufacturing or refurbishing environment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this post-secondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1320 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in describing different types of marine manufacturing industries.
02. Demonstrate proficiency in describing the different types of marine trades and occupations.
03. Demonstrate proficiency in repair and refinishing operations in the marine industry.
04. Demonstrate proficiency in preparing surfaces and applying marine paint finishes.
05. Demonstrate proficiency in preparing surfaces and refinishing fiberglass.
06. Demonstrate proficiency in marine terminology.
07. Demonstrate proficiency in safety practices in marine occupations.
08. Demonstrate proficiency in handling lines and related operations when securing a vessel.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Boat and Yacht Refinishing and Repair POSTSECONDARY NUMBER: I490316

01.0 DEMONSTRATE PROFICIENCY IN DESCRIBING DIFFERENT TYPES OF MARINE MANUFACTURING INDUSTRIES.--The student will be able to:

01.01 Describe the process of manufacturing motor yachts.
01.02 Describe the process of manufacturing sail boats.
01.03 Describe the process of manufacturing small power boats.
01.04 Describe the process of manufacturing center console boats.
01.05 Describe the process of manufacturing of commercial work boats.

02.0 DEMONSTRATE PROFICIENCY IN DESCRIBING THE DIFFERENT TYPES OF MARINE TRADES AND OCCUPATIONS.--The student will be able to:

02.01 Describe the working requirements of a boat finisher/painter.
02.02 Describe the working requirements of a marine carpenter.
02.03 Describe the working requirements of a marine mechanical installer.
02.04 Describe the working requirements of a marine welder fabricator.

03.0 DEMONSTRATE PROFICIENCY IN REPAIR AND REFINISHING OPERATIONS IN THE MARINE INDUSTRY--The student will be able to:

03.01 Identify the different types of work processes.
03.02 Identify the sequential order of work processes.
03.03 Coordinate the work processes in the boatyard manufacturing or refurbishing environment.

04.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND APPLYING MARINE PAINT FINISHES.--The student will be able to:

04.01 Prepare wood surfaces for painting.
04.02 Prepare aluminum surfaces for painting.
04.03 Prepare steel surfaces for painting.
04.04 Apply paint to surfaces by brush.
04.05 Apply paint to surfaces by spray gun.

05.0 DEMONSTRATE PROFICIENCY IN PREPARING SURFACES AND REFINISHING FIBERGLASS. The student will be able to:

05.01 Prepare raw fiberglass surfaces for painting.
05.02 Repair and refinish fiberglass surfaces.

06.0 DEMONSTRATE PROFICIENCY IN MARINE TERMINOLOGY.--The student will be able to:

06.01 Define correct marine terminology
06.02 Define correct marine technical terminology.

07.0 DEMONSTRATE PROFICIENCY IN SAFETY PRACTICES IN MARINE OCCUPATIONS.--The student will be able to:

07.01 Utilize hand tools in the marine occupations.
07.02 Operate power tools in the marine occupations.
07.03 Apply paints, chemicals, fiberglass and compounds.
07.04 Utilize electrical connectors, cords and tools.

07.05 Apply shop safety rules.

08.0 DEMONSTRATE PROFICIENCY IN HANDLING LINES AND RELATED OPERATIONS WHEN SECURING A VESSEL.--The student will be able to:

08.01 Identify the correct nautical knots used in securing a vessel.
08.02 Identify the current terminology of lines.
08.03 Slow a vessel in dock.
08.04 Place fenderboards to protect a vessel.
08.05 Connect ancillary services to a moored vessel.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.

12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Boatbuilding - Wood and Fabricated

CODE NUMBER: Secondary ______ Postsecondary I480799

Florida CIP 0648.079901

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: CAB WOODWK @ 7 G CARPENTRY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as shipfitters (89121678) and boat builders (860.381-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, fiberglass and marine working skills, mechanical systems, piping systems, electrical systems, and frame and form building. A program may be structured to emphasize either wood or fabricated boatbuilding but does not have to cover both areas comprehensively.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in boat framing, mold building, fiberglass lamination and fabrication, millwork operations, installation of mechanical, electrical and piping systems, plug construction and finishing, painting and wooden boat repair.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1360 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply trade accepted terminology and safety.
02. Perform hand lamination operations.
03. Repair gelcoat.
04. Perform framing operations.
05. Perform trim operations.
06. Perform millwork operations.
07. Install mechanical systems.
08. Install piping systems.
09. Install wiring systems.
10. Perform fiberglass fabrication operations.
11. Perform assembly woodworking operations.
12. Perform plug construction operations.
13. Perform plug finishing operations.
14. Construct molds.
15. Repair fiberglass.
16. Apply paint.
17. Repair wooden boats.
18. Service mechanical systems.
19. Service piping and wiring systems.
20. Demonstrate appropriate communication skills.
21. Demonstrate appropriate math skills.
22. Demonstrate appropriate understanding of basic science.
23. Demonstrate employability skills.
24. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:________

PROGRAM TITLE: Boatbuilding-Wood and Fabricated POSTSECONDARY NUMBER: I480799

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Clarify career values.
01.03 Use work schedule and progress chart.
01.04 Use marine and technical terminology.
01.05 Apply shop safety rules.

02.0 PERFORM HAND LAMINATION--The student will be able to:

02.01 Identify tools, materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

03.0 REPAIR GELCOAT--The student will be able to:

03.01 Identify tools, materials and precautions.
03.02 Sand and buff gelcoat.
03.03 Repair gelcoat with putty.
03.04 Repair gelcoat with spray equipment.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 PERFORM MILLWORK OPERATIONS--The student will be able to:

06.01 Operate router and shaper.
06.02 Operate table saw and radial arm saw.
06.03 Fabricate cabinetry from plans.
06.04 Apply plastic laminates to cabinetry.
06.05 Operate jointer and surface planer.
06.06 Operate band saw.

07.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

07.01 Identify tools and precautions.
07.02 Fabricate and install machinery foundations.
07.03 Install engine and shaft line.

07.04 Install mechanical and hydraulic steering.
07.05 Install deck hardware.

08.0 INSTALL PIPING SYSTEMS--The student will be able to:

08.01 Identify tools, materials, and precautions.
08.02 Install through-hull devices.
08.03 Install bilge pump.
08.04 Install tank supports and tank.
08.05 Install hand pump water system.
08.06 Install pressurized water system.
08.07 Install PVC-slip drain system.
08.08 Install engine cooling and exhaust.
08.09 Install fuel systems.

09.0 INSTALL WIRING SYSTEMS--The student will be able to:

09.01 Identify tools, materials, and precautions.
09.02 Install batteries.
09.03 Select DC conductor size.
09.04 Install DC service equipment.
09.05 Install DC lighting and motor circuits.
09.06 Install starting and charging circuits.
09.07 Install bonding and cathodic protection.
09.08 Install AC service equipment.
09.09 Install AC lighting and receptacle circuits.
09.10 Install on-board generator.

10.0 PERFORM FIBERGLASS FABRICATION--The student will be able to:

10.01 Operate chop gun.
10.02 Prepare and apply bonding putty.
10.03 Identify and apply core materials.
10.04 Fabricate parts by vacuum molding.
10.05 Prepare mold for gelcoat.
10.06 Operate gel gun.
10.07 Pull parts.
10.08 Repair molds.
10.09 Maintain molds.

11.0 PERFORM ASSEMBLY WOODWORKING OPERATIONS--The student will be able to:

11.01 Level hull and set up cross-beams.
11.02 Fabricate and install sub-sole components.
11.03 Fabricate and install sail.
11.04 Construct router, shaper, and tracing patterns.
11.05 Cut bulkheads from patterns.
11.06 Construct straight moldings and posts.
11.07 Construct turned corner moldings and posts.
11.08 Construct solid and laminated curved moldings.

12.0 PERFORM PLUG CONSTRUCTION OPERATIONS--The student will be able to:

12.01 Identify components of lines drawings.
12.02 Lay down lines from offsets.
12.03 Pick up body plan.
12.04 Construct patterns and frames.
12.05 Construct, fasten, and fair stringers.
12.06 Apply planking material.

13.0 PERFORM PLUG FINISHING OPERATIONS--The student will be able to:

13.01 Glaze and sheath plug.
13.02 Fill and prime plug.
13.03 Fair plug.
13.04 Prepare and apply finish coat.
13.05 Polish finish coat.

14.0 CONSTRUCT MOLDS--The student will be able to:

14.01 Prepare plug for mold lamination.
14.02 Gel and skin mold.
14.03 Laminate mold.
14.04 Brace and pull mold.
14.05 Prepare mold for first use.

15.0 REPAIR FIBERGLASS--The student will be able to:

15.01 Install point loads and stiffeners.
15.02 Repair laminates.
15.03 Renew bottom paint.

16.0 APPLY PAINT--The student will be able to:

16.01 Identify materials and precautions.
16.02 Repair/prepare surface.
16.03 Apply and prepare primer.
16.04 Apply masking and pull tapes.
16.05 Apply paint with spray equipment.

17.0 REPAIR WOODEN BOATS--The student will be able to:

17.01 Identify wooden boat construction types.
17.02 Repair plank-on-frame construction.
17.03 Use epoxy resin in restoration/repair.
17.04 Maintain wooden boats.

18.0 SERVICE MECHANICAL SYSTEMS--The student will be able to:

18.01 Perform routine engine service.
18.02 Maintain hydraulic steering systems.
18.03 Repair and maintain mechanical steering.
18.04 Inspect mast, boom, and rigging.
18.05 Repair rigging.

19.0 SERVICE PIPING AND WIRING SYSTEMS--The student will be able to:

19.01 Maintain and repair portable water systems.
19.02 Maintain and repair fuel systems.
19.03 Install and maintain sewage systems.
19.04 Troubleshoot DC systems.
19.05 Troubleshoot AC systems.

20.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

20.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
20.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
20.03 Read and follow written and oral instructions.
20.04 Answer and ask questions coherently and concisely.
20.05 Read critically by recognizing assumptions and implications and by

evaluating ideas.
20.06 Demonstrate appropriate telephone/communication skills.

21.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

21.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
21.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
21.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
21.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
21.05 Demonstrate an understanding of federal, state and local taxes and their computation.

22.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

22.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
22.02 Draw conclusions or make inferences from data.
22.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
22.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

23.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

23.01 Conduct a job search.
23.02 Secure information about a job.
23.03 Identify documents which may be required when applying for a job interview.
23.04 Complete a job application form correctly.
23.05 Demonstrate competence in job interview techniques.
23.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
23.07 Identify acceptable work habits.
23.08 Demonstrate knowledge of how to make appropriate job changes.
23.09 Demonstrate acceptable employee health habits.
23.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

24.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

24.01 Define entrepreneurship.
24.02 Describe the importance of entrepreneurship to the American economy.
24.03 List the advantages and disadvantages of business ownership.
24.04 Identify the risks involved in ownership of a business.
24.05 Identify the necessary personal characteristics of a successful entrepreneur.
24.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Building Construction Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.100101

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

__x__Postsecondary Vocational _____ Other ________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a construction manager (15017016), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, construction practices, building codes, blueprint reading, personnel and resource management skills, safety, site selection and planning and building residential and commercial structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in steel and wood construction methods, construction materials, occupational safety, building codes, and building inspections.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is Associate Degree.

IV. <u>INTENDED OUTCOMES</u>: After successfully completing this program, the student will be able to:

01. Communicate effectively.
02. Identify, select and supervise application of construction materials.
03. Produce, read and interpret drawings and specifications.
04. Interpret and apply codes, regulations, and contract documents.
05. Survey and investigate construction sites.
06. Select and maintain construction site tools and equipment.
07. Interpret basic designs and apply sound construction principles.
08. Take off quantities and estimate costs.
09. Plan, coordinate, schedule and control projects.
10. Perform tests and inspections.
11. Select, train and supervise personnel.
12. Demonstrate efficient office and administrative procedures.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Building Construction Technology POSTSECONDARY NUMBER: ______

01.0 COMMUNICATE EFFECTIVELY--The student will be able to:

01.01 Maintain notice board.
01.02 Maintain job diary.
01.03 Prepare inter-office memos.
01.04 Prepare business correspondence.
01.05 Set-up surveyors field book.
01.06 Prepare daily project report.
01.07 Prepare requisitions for equipment and materials.
01.08 Write specifications for equipment purchase.
01.09 Prepare minutes from job-site meetings.
01.10 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
01.11 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
01.12 Read and follow written and oral instructions.
01.13 Answer and ask questions coherently and concisely.
01.14 Read critically by recognizing assumptions and implications and by evaluating ideas.
01.15 Demonstrate appropriate telephone/communication skills.

02.0 IDENTIFY, SELECT, AND SUPERVISE APPLICATION OF CONSTRUCTION MATERIALS--The student will be able to:

02.01 Select cleaning materials.
02.02 Select soils.
02.03 Identify soil types.
02.04 Select wood framing.
02.05 Select rough hardware.
02.06 Select waterproofing and protective coatings.
02.07 Select insulation and vapor barriers.
02.08 Select ceiling finishes and wall finishes.
02.09 Select form work materials.
02.10 Select concrete.
02.11 Select windows and doors.
02.12 Select adhesives and sealants.
02.13 Select roofing materials.
02.14 Select sheet metal materials.
02.15 Select mill work.
02.16 Select painting and decorating materials.
02.17 Select miscellaneous metals.
02.18 Select asphaltic materials.
02.19 Select masonry materials.
02.20 Select manufactured specialties.
02.21 Select reinforcing concrete materials.
02.22 Select structural steel.
02.23 Select finishing hardware.
02.24 Select foundation piling and casing materials.
02.25 Select precast concrete materials.
02.26 Select plumbing and drainage material.
02.27 Select electrical components and equipment.
02.28 Identify mechanical components and equipment.

03.0 PRODUCE, READ, AND INTERPRET DRAWINGS AND SPECIFICATIONS--The student

will be able to:

03.01 Identify, select and use drafting instruments.
03.02 Use technical lettering.
03.03 Identify and use architectural symbols.
03.04 Use drafting reproduction equipment.
03.05 Take site notes and measurements.
03.06 Identify and use electrical symbols.
03.07 Prepare site sketches.
03.08 Identify and use mechanical symbols.
03.09 Identify and use topographical symbols.
03.10 Interpret land surveyor's notes.
03.11 Prepare topographic drawings.
03.12 Prepare working sketches and "as built" drawings.
03.13 Prepare architectural drawings.
03.14 Interpret architectural drawings and specifications.
03.15 Evaluate finishing hardware schedules.
03.16 Prepare structural drawings.
03.17 Interpret structural drawings and specifications.
03.18 Interpret reinforcing steel drawings and bar list.
03.19 Interpret and apply A. S. T. M. standards.
03.20 Interpret and apply C. S. A. standards.
03.21 Prepare presentation drawings.
03.22 Evaluate shop drawings.
03.23 Prepare mechanical drawings.
03.24 Interpret mechanical drawings and specifications.
03.25 Prepare electrical drawings.
03.26 Interpret electrical drawings and specifications.

04.0 INTERPRET AND APPLY LAWS, CODES, REGULATIONS, AND CONTRACT DOCUMENTS--The student will be able to:

04.01 Interpret federal and state safety codes.
04.02 Interpret pre-qualification documents.
04.03 Interpret, apply, and control addenda.
04.04 Interpret bonding insurance procedures.
04.05 Interpret, apply, and control change orders.
04.06 Interpret and apply state standard building code.
04.07 Interpret and apply workmen's compensation requirements.
04.08 Interpret and apply standard form of tender.
04.09 Compile a complete set of contract documents.
04.10 Interpret and apply contracts and mechanics lien act.

05.0 SURVEY AND INVESTIGATE CONSTRUCTION SITES--The student will be able to:

05.01 Lay out and measure site.
05.02 Use surveying rods.
05.03 Make measurements utilizing surveying rods and levels.
05.04 Make measurement using transit.
05.05 Survey construction sites.
05.06 Evaluate site and existing services for services required.
05.07 Survey and lay out building lines and levels.
05.08 Use digital and electronic survey equipment.
05.09 Identify types of sub surface investigations.
05.10 Determine sample requirements.
05.11 Conduct soil test.
05.12 Interpret soil reports.
05.13 Conduct vane shear test.
05.14 Compile boring log.

06.0 SELECT AND MAINTAIN CONSTRUCTION SITE TOOLS AND EQUIPMENT--The student will be able to:

06.01 Select fire fighting equipment.
06.02 Select and maintain safety equipment.
06.03 Select cleaning equipment.
06.04 Select miscellaneous small tools.
06.05 Select and maintain shop and power tools.
06.06 Select surveying equipment.
06.07 Select concrete finishing equipment.
06.08 Select plaster and mortar mixing equipment.
06.09 Select and maintain temporary site offices, storage, and restroom facilities.
06.10 Select temporary building enclosures.
06.11 Select concrete placing equipment.
06.12 Prepare equipment service schedules.
06.13 Evaluate type and size of earth moving equipment needed for the project.
06.14 Select and maintain construction site communication equipment.
06.15 Select concrete batching and mixing equipment.
06.16 Select compaction equipment.
06.17 Identify pile driving and earth boring equipment.
06.18 Select and maintain temporary power and lighting equipment.
06.19 Select and maintain temporary water services.
06.20 Select demolition equipment.
06.21 Select balance of power and plant equipment.

07.0 INTERPRET BASIC DESIGNS AND APPLY CONSTRUCTION PRINCIPLES--The student will be able to:

07.01 Design, erect and maintain staging, scaffolding and falsework.
07.02 Coordinate and supervise resilient flooring.
07.03 Coordinate and supervise painting and finishes.
07.04 Coordinate and supervise windows and doors.
07.05 Coordinate and supervise carpentry and millwork.
07.06 Coordinate and supervise concrete and formwork.
07.07 Coordinate and supervise miscellaneous roofing and sheet metal.
07.08 Coordinate and supervise miscellaneous metal.
07.09 Plan and coordinate excavation and foundation work.
07.10 Coordinate and supervise lath and plaster and dry wall.
07.11 Identify modular and prefabricated applications.
07.12 Coordinate and supervise masonry work.
07.13 Coordinate and supervise tile and terrazzo.
07.14 Design concrete mix.
07.15 Determine strength of concrete.
07.16 Calculate temporary electrical power requirements.
07.17 Design asphaltic hot mix.
07.18 Design pavement structure.
07.19 Calculate modules of electricity.
07.20 Determine moments of inertia.
07.21 Calculate shears and bending moments.
07.22 Calculate deflection.
07.23 Calculate columns.
07.24 Determine strength of lumber.
07.25 Determine strength of steel.
07.26 Design forms and supports.
07.27 Coordinate and supervise structural steel work.
07.28 Coordinate and supervise mechanical work.
07.29 Coordinate and supervise elevator installation.
07.30 Coordinate and supervise electrical installation.

08.0 TAKE OFF QUANTITIES AND ESTIMATE COST--The student will be able to:

08.01 Make calculations.
08.02 Estimate quantities of concrete.

08.03 Compile lists of sub-trades for project.
08.04 Take off quantities of paving.
08.05 Estimate quantities of rough carpentry.
08.06 Obtain and build up material costs.
08.07 Interpret contract document.
08.08 Estimate quantities of framework.
08.09 Estimate quantities of excavation and fill.
08.10 Estimate quantities of landscaping.
08.11 Call sub trade tenders.
08.12 Take off quantities of miscellaneous metals.
08.13 Take off quantities of millwork.
08.14 Take off quantities of structural steel.
08.15 Take off quantities of manufactured specialties.
08.16 Analyze and project plant and equipment costs.
08.17 Analyze and project general condition costs.
08.18 Analyze and project labor unit costs.
08.19 Estimate quantities of reinforcing steel.
08.20 Estimate quantities of masonry.
08.21 Analyze and project site overhead costs.
08.22 Evaluate sub trade bids.
08.23 Summarize project cost and complete tenders prices.

09.0 PLAN, COORDINATE, SCHEDULE AND CONTROL PROJECTS--The student will be able to:

09.01 Prepare daily time sheets.
09.02 Record and control materials received.
09.03 Allocate efficient use of site space.
09.04 Maintain clean and orderly construction site.
09.05 Store materials and equipment.
09.06 Describe units of work measurement.
09.07 Coordinate and control use of construction tools and equipment.
09.08 Prepare progress billing.
09.09 Store chemicals and paints.
09.10 Prepare work schedules.
09.11 Prepare material delivery schedules.
09.12 Expedite delivery of manufactured materials.
09.13 Analyze productivity.
09.14 Prepare sub-trades schedules.
09.15 Prepare and code daily costs.
09.16 Record deficiencies as a result of project inspections.
09.17 Prepare coded cost break downs.
09.18 Take appropriate action to correct project deficiencies.
09.19 Interpret computer output.
09.20 Prepare cash flow schedules.
09.21 Prepare schedules for computer input.
09.22 Develop and maintain coded cost systems.
09.23 Prepare critical path schedule.
09.24 Monitor schedule to control project.

10.0 PERFORM TESTS AND INSPECTIONS--The student will be able to:

10.01 Conduct concrete impact hammer test.
10.02 Conduct concrete slump test.
10.03 Conduct concrete air content test.
10.04 Conduct sieve and hydrometer analysis test.
10.05 Conduct concrete unit weight test.
10.06 Conduct unit weight of aggregate test.
10.07 Calculate fineness modules.
10.08 Conduct lumber moisture content test.
10.09 Conduct liquid and plastics limits tests.
10.10 Check concrete placing and consolidation procedures.

10.11 Conduct moisture content test on soil.
10.12 Check form work.
10.13 Conduct moisture density test.
10.14 Calculate percentage of compaction.
10.15 Conduct density of material in place tests.
10.16 Sample, make, cure and test concrete compressive strength specimen.
10.17 Conduct chemical analysis of water.
10.18 Check reinforcing steel and placing.
10.19 Inspect placing of fill and compaction procedures.
10.20 Conduct compressive strength test on concrete blocks.
10.21 Conduct roofing test.
10.22 Make mortar cubes and perform compressive strength test.
10.23 Conduct soundness test.
10.24 Conduct specific gravity tests.
10.25 Sample, make, cure and test flexual strength specimen.
10.26 Prepare Marshall test specimens.
10.27 Conduct unconfined compression test.
10.28 Conduct density test of Marshall test specimens.
10.29 Calculate air voids and V. M. A. values.
10.30 Calculate bitumen extraction test.
10.31 Conduct C. B. R. test.
10.32 Conduct California sand equivalent test.
10.33 Conduct Rice specific gravity tests.
10.34 Conduct Marshall stability and flow tests.
10.35 Check asphalt mixing plant.
10.36 Conduct abrasion test.
10.37 Conduct permeability test.
10.38 Conduct triaxial compression test.

11.0 SELECT, TRAIN, AND SUPERVISE PERSONNEL--The student will be able to:

11.01 Apply first aid.
11.02 Instruct new employee on company safety regulations.
11.03 Interpret basic company policies.
11.04 Select and hire employees.
11.05 Interview and evaluate perspective employees.
11.06 Evaluate employees' performance.
11.07 Write job description.
11.08 Evaluate employee grievance.
11.09 Interpret labor contracts.

12.0 DEMONSTRATE EFFICIENT OFFICE AND ADMINISTRATIVE PROCEDURES--The student will be able to:

12.01 Organize work area.
12.02 Select and use appropriate forms.
12.03 Develop and maintain filing system.
12.04 Maintain inventory of physical assets.
12.05 Set up and maintain technical reference library.
12.06 Maintain a system for field work authorizations.
12.07 Maintain a system for control and processing contract changes.
12.08 Maintain a system for back charges.
12.09 Interpret basic company accounting procedures.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and

whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Building Repair and Maintenance

CODE NUMBER: Secondary 8721300 Postsecondary ______

Florida CIP 0646.040100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ___7-9 x 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: BLDG MAINT @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as general maintenance repairers (85132625). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: use of blueprints and schematics, basic carpentry repairs and maintenance; basic electrical system fault diagnosis and repair; basic plumbing system repairs and maintenance; basic masonry repairs and maintenance; maintenance of air conditioning and heating systems; application of finishes; cleaning of building surfaces; recordkeeping; use and care of hand tools; use of power tools and equipment; and use of current industry standards, practices and techniques.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8721310	Building Repair and Maintenance 1
8721320	Building Repair and Maintenance 2
8721330	Building Repair and Maintenance 3
8721340	Building Repair and Maintenance 4
8721350	Building Repair and Maintenance 5
8721360	Building Repair and Maintenance 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: carpentry, plumbing, masonry, air conditioning, application of finishes and cleaning structural surfaces.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate basic maintenance fundamentals.
02. Demonstrate ability to read plans and drawings.
03. Demonstrate proficiency using basic hand tools.
04. Demonstrate proficiency using power tools.
05. Repair interior floors, walls and ceilings.
06. Perform repairs on doors, windows and screens.
07. Repair and replace cabinets.
08. Apply finishes to properly prepared surfaces.
09. Identify wood construction components.
10. Repair roofs.
11. Repair exterior masonry surfaces.
12. Perform plumbing system repairs and maintenance.
13. Perform electrical system fault diagnosis and repair.
14. Perform heating and cooling system diagnosis, repair and maintenance.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate and practice employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8721300
PROGRAM TITLE: Building Repair and Maintenance POSTSECONDARY NUMBER:

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules and practices.
01.02 Make job-related decimal and fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Use ruler and tape measure to determine measurements.
01.07 Compute feet, inches and yards.
01.08 Change hours and minutes to decimals, fractions and mixed numbers.
01.09 Find inside and outside diameters of a pipe.
01.10 Calculate the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Use the architect's scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters' squares and levels.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Setup, use and maintain portable power orbital sander, belt sander and finish sander.
04.02 Setup, use and maintain portable drill and power screwdriver.
04.03 Setup, use and maintain hand-held circular saw and reciprocating saw.

04.04 Setup, use and maintain a radial arm saw.
04.05 Setup, use and maintain a table saw.
04.06 Setup, use and maintain a drill press.
04.07 Setup, use and maintain a band saw.
04.08 Setup, use and maintain a power plane.

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install interior trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the processes to shampoo carpets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

08.01 Erect an extension ladder for working at a height of twelve feet.
08.02 Erect a scaffold to work at a height of twelve feet.
08.03 Paint a surface with a roller, brush and sprayer.
08.04 Prepare, seal and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair roof gutters and downspouts.

10.03 Seal pipes and vents on roofs.
10.04 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.
11.04 Mix tuck pointing mortar.
11.05 Apply mortar for brickwork.
11.06 Identify methods of putting up the line.
11.07 Identify types of trowels.
11.08 Apply mortar for block work.
11.09 List reasons for cleaning.
11.10 Identify cleaning equipment.
11.11 List types of cleaning material.
11.12 List reasons for caulking.
11.13 Match types of caulking to specific uses.
11.14 Replace caulking in expansion joints.
11.15 List safety precautions to follow when cleaning.
11.16 Identify methods of wall cleaning.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Repair or replace water closet components.
12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a nonadjustable die stock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 Deenergize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a fluorescent system.
13.09 Check a heating-cooling thermostat.

13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.
13.12 Service air filters.
13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.

14.0 PERFORM HEATING AND COOLING SYSTEM DIAGNOSIS, REPAIR AND MAINTENANCE -- The student will be able to:

14.01 Display a basic knowledge of heating/cooling principles, code requirements and understand methods of calculating heating and cooling loads.
14.02 Demonstrate knowledge of the operation and types of the following heating methods; water, steam, forced air and heat pumps.
14.03 Demonstrate the ability to troubleshoot and repair a circulation pump, zone valves, burners, pilot lights, and thermocouples in a heating system.
14.04 Demonstrate the ability to identify and use refrigerants.
14.05 Describe the proper procedures for scaling and recharging window unit air conditioners.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able

to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 1 COURSE NUMBER: 8721310

COURSE DESCRIPTION:

This course is designed to provide instruction in basic math and safety, blueprint reading and use of basic hand tools.

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules and practices.
01.02 Make job-related decimal and fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Use ruler and tape measure to determine measurements.
01.07 Compute feet, inches and yards.
01.08 Change hours and minutes to decimals, fractions and mixed numbers.
01.09 Find inside and outside diameters of a pipe.
01.10 Calculate the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Use the architect's scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters' squares and levels.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 2 COURSE NUMBER: 8721320

COURSE DESCRIPTION:

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Setup, use and maintain portable power orbital sander, belt sander and finish sander.
04.02 Setup, use and maintain portable drill and power screwdriver.
04.03 Setup, use and maintain hand-held circular saw and reciprocating saw.
04.04 Setup, use and maintain a radial arm saw.
04.05 Setup, use and maintain a table saw.
04.06 Setup, use and maintain a drill press.
04.07 Setup, use and maintain a band saw.
04.08 Setup, use and maintain a power plane.

05.0 REPAIR INTERIOR FLOORS, WALLS, AND CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install interior trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the processes to shampoo carpets.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a

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materials list containing a minimum of six items.

16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance — PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 3 — COURSE NUMBER: 8721330

COURSE DESCRIPTION:

This course is designed to provide instruction for performing repairs on doors, windows and screens and in repairing and replacing cabinets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance — PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 4 — COURSE NUMBER: 8721340

COURSE DESCRIPTION:

This course is designed to provide instruction in applying finishes to properly prepared surfaces and identifying wood construction components.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

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08.01 Erect an extension ladder for working at a height of twelve feet.
08.02 Erect a scaffold to work at a height of twelve feet.
08.03 Paint a surface with a roller, brush and sprayer.
08.04 Prepare, seal and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance
PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 5
COURSE NUMBER: 8721350

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing roofs and exterior masonry surfaces and in performing plumbing system repairs and maintenance.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair roof gutters and downspouts.
10.03 Seal pipes and vents on roofs.
10.04 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.
11.04 Mix tuck pointing mortar.
11.05 Apply mortar for brickwork.
11.06 Identify methods of putting up the line.
11.07 Identify types of trowels.
11.08 Apply mortar for block work.
11.09 List reasons for cleaning.
11.10 Identify cleaning equipment.
11.11 List types of cleaning material.
11.12 List reasons for caulking.
11.13 Match types of caulking to specific uses.
11.14 Replace caulking in expansion joints.

11.15 List safety precautions to follow when cleaning.
11.16 Identify methods of wall cleaning.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Repair or replace water closet components.
12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a nonadjustable die stock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Building Repair and Maintenance — PROGRAM NUMBER: 8721300

COURSE TITLE: Building Repair and Maintenance 6 — COURSE NUMBER: 8721360

COURSE DESCRIPTION:

This course is designed to provide instruction in performing electrical system fault diagnosis and repair and in demonstrating employability skills and entrepreneurship understanding.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 Deenergize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a fluorescent system.
13.09 Check a heating-cooling thermostat.
13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.

13.12 Service air filters.
13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.

14.0 PERFORM HEATING AND COOLING SYSTEM DIAGNOSIS, REPAIR AND MAINTENANCE--The student will be able to:

14.01 Display a basic knowledge of heating/cooling principles, code requirements and understand methods of calculating heating and cooling loads.
14.02 Demonstrate knowledge of the operation and types of the following heating methods; water, steam, forced air and heat pumps.
14.03 Demonstrate the ability to troubleshoot and repair a circulation pump, zone valves, burners, pilot lights, and thermocouples in a heating system.
14.04 Demonstrate the ability to identify and use refrigerants
14.05 Describe the proper procedures for scaling and recharging window unit air conditioners.

18.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Building Maintenance and Utilities Management

CODE NUMBER: Secondary ____ Postsecondary I460421

Florida CIP 0646.040101

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other30,31

CERTIFICATION COVERAGE: BLDG MAINT @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as general maintenance repairers (85132625) and building maintenance repairers (899.381.010), painters (840.381-010), building cleaners (891.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: use of blueprints and schematics; basic carpentry repairs and maintenance; basic electrical system fault diagnosis and repair; basic plumbing system repairs and maintenance; basic masonry repairs and maintenance; maintenance of air conditioning and heating systems; application of finishes; cleaning of building surfaces; recordkeeping use and care of hand tools, power tools and equipment; and use of current industry standards, practices and techniques.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: carpentry, plumbing, masonry, air conditioning, application of finishes, cleaning structural surfaces and use and care of hand tools and equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has

chosen as a career goal. The student must receive compensation for work performed.
In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate basic maintenance fundamentals.
02. Demonstrate ability to read plans and drawings.
03. Demonstrate proficiency using basic hand tools.
04. Demonstrate proficiency using power tools.
05. Repair interior floors, walls, and ceilings.
06. Perform repairs on doors, windows and screens.
07. Repair and replace cabinets.
08. Apply finishes to properly prepared surfaces.
09. Identify wood construction components.
10. Repair roofs.
11. Repair exterior masonry surfaces.
12. Perform plumbing system repairs and maintenance.
13. Perform electrical system fault diagnosis and repair.
14. Perform heating and cooling system diagnosis, repair and maintenance.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate and practice employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — SECONDARY NUMBER:

PROGRAM TITLE: Building Maintenance and Utilities Management — POSTSECONDARY NUMBER: I460421

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules and practices.
01.02 Make job-related decimal and fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Use ruler and tape measure to determine measurements.
01.07 Compute feet, inches and yards.
01.08 Change hours and minutes to decimals, fractions and mixed numbers.
01.09 Find inside and outside diameters of a pipe.
01.10 Calculate the time charged for labor of a job.
01.11 Solve job-related problems using mathematical handbooks charts and tables.
01.12 Determine ratios and proportions.
01.13 Convert measurements from English to metric and from metric to English.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Use an architect's scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters' squares and levels.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Setup, use and maintain portable power orbital sander, belt sander and finish sander.
04.02 Setup, use and maintain portable drill and power screwdriver.
04.03 Setup, use and maintain hand-held circular saw, reciprocating saw.
04.04 Setup, use and maintain a radial arm saw.
04.05 Setup, use and maintain a table saw.
04.06 Setup, use and maintain a drill press.
04.07 Setup, use and maintain a band saw.
04.08 Setup, use and maintain a power plane.
04.09 Setup, use and maintain a laminate trimmer.
04.10 Setup, use and maintain an electric router.
04.11 Setup, use and maintain a motorized miter saw.

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install interior trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the process used to shampoo carpets.
05.10 Describe the process for repairing carpets.
05.11 Repair roll flooring.
05.12 Check and repair ceiling tiles.
05.13 Identify types of roll insulation.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS--The student will be able to:

06.01 Install a pre-hung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.
06.13 Check repair and install panic bars on doors.
06.14 Repair a wooden window frame.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.
07.06 Install cabinet shelving.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

08.01 Erect an extension ladder for working at a height of twelve feet.
08.02 Erect a scaffold to work at a height of twelve feet.
08.03 Paint a surface with a roller, brush and sprayer.

08.04 Prepare, seal and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:
09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.
09.05 Identify types of wall intersections.
09.06 Identify types of roof sheathing and describe installation procedures.
09.07 Identify types of wall sheathing and describe installation procedures.
09.08 Identify types of floor sheathing and describe installation procedures.
09.09 Identify main parts and types of trusses.
09.10 Identify pieces of hardware used in truss construction.
09.11 Describe types of wood splices.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair roof gutters and downspouts.
10.03 Seal pipes and vents on roofs.
10.04 Check and repair sheetmetal roofs.
10.05 Check and repair wood shingles.
10.06 Check and repair built-up roofs.
10.07 Describe installation of roof flashing.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.
11.04 Mix tuck pointing mortar.
11.05 Apply mortar for brickwork.
11.06 Identify methods of putting up the line.
11.07 Identify types of trowels.
11.08 Apply mortar for block work.
11.09 List reasons for cleaning.
11.10 Identify cleaning equipment.
11.11 List types of cleaning material.
11.12 List reasons for caulking.
11.13 Match types of caulking to specific uses.
11.14 Replace caulking in expansion joints.
11.15 List safety precautions to follow when cleaning.
11.16 Identify methods of wall cleaning.
11.17 Describe procedures for stucco repair.
11.18 Mix types of mortar (M,N,S and O) mechanically and by hand.
11.19 Identify pointing tools.
11.20 Point new work.
11.21 Point old work.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Repair or replace water closet components.

12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a nonadjustable die stock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.
12.24 Hook up ice makers.
12.25 Bend steel pipe with a heavy-duty bending tool.
12.26 Bend steel pipe with a chain vise and torch.
12.27 Braze pipe with a gas torch and filler metal.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 Deenergize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a fluorescent system.
13.09 Check a heating-cooling thermostat.
13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.
13.12 Service air filters.
13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.
13.16 Rewire a lamp or appliance.
13.17 Service belt drive blowers.
13.18 Install exhaust fans.
13.19 Replace hot water heater unit component parts.
13.20 Wire a blower motor into an electrical supply.
13.21 Change a drive belt in an air circulation system.
13.22 Check and recharge freon gas supply on small air conditioners.

14.0 PERFORM HEATING AND COOLING SYSTEM DIAGNOSIS, REPAIR AND MAINTENANCE--The student will be able to:

14.01 Display a basic knowledge of heating/cooling principles, code requirements and understand methods of calculating heating and cooling loads.
14.02 Demonstrate knowledge of the operation and types of the following heating methods; water, steam, forced air and heat pumps.
14.03 Demonstrate the ability to troubleshoot and repair a circulation pump, zone valves, burners, pilot lights, and thermocouples in a heating system.
14.04 Demonstrate the ability to identify and use refrigerants.
14.05 Describe the proper procedures for scaling and recharging window

unit air conditioners.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.

19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Cabinetmaking and Millwork

CODE NUMBER: Secondary ______ Postsecondary I480703

Florida CIP 0648.070300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: CARPENTRY @ 7 G CAB WOOD WK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cabinetmakers (89311705) and bench carpenters (660.280-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: instruction in using hand tools; operating portable power tools and stationary power woodworking machines; planning, designing and layout of cabinets and casework; constructing and assembling cabinet components; constructing joints; fastening stock and joints; constructing and installing cabinet drawers and doors; applying laminates; finishing surfaces; performing millwork operations; installing cabinets; and basic safety rules and procedures.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: table saws, radial arm saws, jointers and planers, band saws, routers and shapers, belt sanders, drills and drill presses, portable power hand tools and hand tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 8.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other. This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in applying safety rules and procedures.
02. Demonstrate proficiency using hand tools.
03. Demonstrate proficiency operating portable power tools.
04. Demonstrate proficiency operating stationary power woodworking machines.
05. Demonstrate proficiency in planning, designing and layout of cabinets and casework.
06. Demonstrate proficiency in constructing and assembling cabinet components.
07. Demonstrate proficiency in constructing joints.
08. Demonstrate ability to fasten stock and joints.
09. Demonstrate proficiency in constructing and installing cabinet drawers and doors.
10. Demonstrate proficiency in applying laminates.
11. Demonstrate ability to finish surfaces.
12. Demonstrate proficiency in constructing and laminating curved pieces.
13. Demonstrate proficiency in performing millwork operations.
14. Demonstrate ability to install cabinets.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Cabinetmaking and Millwork POSTSECONDARY NUMBER: I480703

01.0 DEMONSTRATE PROFICIENCY IN APPLYING SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Apply personal safety rules and procedures.
01.03 Apply fire safety rules and procedures.
01.04 Apply electrical safety rules and procedures.
01.05 Apply chemical safety rules and procedures.

02.0 DEMONSTRATE PROFICIENCY USING HAND TOOLS--The student will be able to:

02.01 Identify types and uses of files and rasps.
02.02 Lay out angles with squares.
02.03 Gage lines parallel to an edge with fingers, rules and squares.
02.04 Make cross cuts and rip cuts using hand saws.
02.05 Cut stock at an angle using a miter box.
02.06 Cut stock with a coping saw, back saw and keyhole saw.
02.07 Cut metal using a hacksaw.
02.08 Divide a distance into equal spaces using a divider.
02.09 Scribe and fit edges of stock to an irregular surface.
02.10 Sharpen drill bits and wood chisels.
02.11 Drill holes with hand drills.
02.12 Drive and set nails and screws.
02.13 Sharpen planes and cabinet scrapers.
02.14 Smooth wood surfaces using planes and cabinet scrapers.
02.15 Measure stock using rulers and tape measures.
02.16 Use a wood chisel to notch or mortise stock.

03.0 DEMONSTRATE PROFICIENCY OPERATING PORTABLE POWER TOOLS--The student will be able to:

03.01 Utilize a circular saw to make straight, beveled and compound angle cuts.
03.02 Utilize a saber saw to make straight, beveled and compound angle cuts.
03.03 Utilize a portable drill to bore holes to specified depths.
03.04 Drive screws using a power screwdriver or screw gun.
03.05 Utilize a power plane to square a straight edge.
03.06 Utilize a router to shape edges and cut a groove, dado and rabbet.
03.07 Sand surfaces with a belt sander and a finishing sander.
03.08 Fasten material with a pneumatic stapler or nailer.
03.09 Fasten a butt joint with a pneumatic corrugated fastener tool.

04.0 DEMONSTRATE PROFICIENCY OPERATING STATIONARY POWER WOODWORKING MACHINES--The student will be able to:

04.01 Use a table saw to make cross, rip, miter, dado and groove cuts.
04.02 Use a radial arm saw to make cross, rip, miter, compound angle, dado and groove cuts.
04.03 Use a drill press to drill, counterbore and countersink holes in stock and bore holes at an angle.
04.04 Use a jointer to square, bevel or chamfer stock.
04.05 Use a plane to trim stock to a specified thickness.
04.06 Use a band saw to make straight, curved, rectangular and freehand cuts.

04.07 Remove and replace band saw blades and adjust guides.
04.08 Use a router to cut stock with and without a template.
04.09 Use a shaper to mold stock with a template, fence, miter gage or pin and bearing.
04.10 Use a power miter saw to make miter cuts.
04.11 Sand surfaces using power belt, disc and spindle sanders.

05.0 DEMONSTRATE PROFICIENCY IN PLANNING, DESIGNING AND LAYOUT OF CABINETS AND CASEWORK--The student will be able to:

05.01 Convert measurements in inches to metric and metric to inches.
05.02 Interpret blueprints and explain common abbreviations used on drawings.
05.03 Draw plans to scale using an architect's ruler.
05.04 Lay out a rectangle, hexagon, octagon, ellipse and circle.
05.05 Lay out angles.
05.06 Select and match wood stock for compatibility of grain and color.
05.07 Make an elevation drawing of a job.
05.08 Make an orthographic drawing of a job.
05.09 Draw sections and details of cabinet components.
05.10 Make a layout rod for a job.
05.11 Make a cutting list for a job.
05.12 Develop a plan of procedure for a job.
05.13 Make out work orders and billings.
05.14 Develop Sketching skills.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND ASSEMBLING CABINET COMPONENTS--The student will be able to:

06.01 Lay out and cut cabinet components from solid wood, plywood and particle board.
06.02 Lay out and cut joints in cabinet components.
06.03 Assemble and fasten cabinet base frame.
06.04 Assemble and fasten cabinet sides, back and front.
06.05 Prepare cabinet components for special fittings.
06.06 Cut and assemble cabinet shelving.
06.07 Assemble and fasten cabinet top.
06.08 Lay out and cut back splash components.

07.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING JOINTS--The student will be able to:

07.01 Construct a butt joint.
07.02 Construct a doweled butt joint.
07.03 Construct a dado joint.
07.04 Construct a rabbeted joint.
07.05 Construct a lap joint.
07.06 Construct a miter joint.
07.07 Install dowels in common wood joints.
07.08 Construct a tongue and groove joint.
07.09 Construct a splined edge joint.
07.10 Construct a mortise and tenon joint.
07.11 Construct a dovetail joint.
07.12 Construct an end lap joint.
07.13 Construct a middle lap joint.
07.14 Construct a cross lap joint.
07.15 Construct a dovetail lap joint.
07.16 Construct a draw bolt joint.

08.0 DEMONSTRATE ABILITY TO FASTEN STOCK AND JOINTS--The student will be able to:

08.01 Identify types of glues and describe their applications.
08.02 Fasten stock with wood glue and clamps.
08.03 Glue boards edge to edge.
08.04 Fasten and glue mitered frames.
08.05 Fasten and glue doweled joints and segments.
08.06 Fasten stock and joints with nails, screws, bolts and staples.
08.07 Fill and finish nail and screw holes.
08.08 Install wood plugs in prepared holes.
08.09 Install and glue corner blocks.

09.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND INSTALLING CABINET DRAWERS AND DOORS--The student will be able to:

09.01 Construct an overlay drawer.
09.02 Construct a lipped drawer.
09.03 Construct a flush drawer.
09.04 Install drawer guides.
09.05 Install drawer hardware.
09.06 Construct solid, panel and tambour doors.
09.07 Fit and hand overlay, lipped and flush doors.
09.08 Install hardware on doors.
09.09 Assemble and install glass doors.
09.10 Install sliding doors.

10.0 DEMONSTRATE PROFICIENCY IN APPLYING LAMINATES--The student will be able to:

10.01 Cut laminates to rough size of cabinet surface.
10.02 Apply glue to laminate and cabinet surfaces.
10.03 Accurately place laminate on cabinet surfaces.
10.04 Press and smooth laminate on cabinet surfaces.
10.05 Trim off excess laminate and file edges.
10.06 Seam two pieces of laminate together.
10.07 Remove excess glue from laminate surfaces.

11.0 DEMONSTRATE ABILITY TO FINISH SURFACES--The student will be able to:

11.01 Sand wood surfaces for finishing.
11.02 Stain, bleach, fill and seal wood surfaces.
11.03 Apply clear and pigmented finishes using a brush.
11.04 Apply clear and pigmented finishes using a spray gun.
11.05 Apply wax finishes.

12.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND LAMINATING CURVED PIECES--The student will be able to:

12.01 Cut a curved piece from solid stock.
12.02 Make a curved piece by saw kerfing.
12.03 Construct a curved piece using curved segments.
12.04 Construct a curved piece using thin laminated pieces.

13.0 DEMONSTRATE PROFICIENCY IN PERFORMING MILLWORK OPERATIONS--The student will be able to:

13.01 Cut shaped moldings to specifications.
13.02 Cut moulding ends at various angles to fit.
13.03 Cut a cornice.
13.04 Cut shelving boards.

14.0 DEMONSTRATE ABILITY TO INSTALL CABINETS--The student will be able to:

14.01 Fasten mounting boards to a wall with screws and toggle bolts.

14.02 Place and level a cabinet base.
14.03 Fasten a cabinet base to a wall.
14.04 Place and level suspended cabinet units.
14.05 Fasten a suspended cabinet unit to a wall or ceiling.
14.06 Cut and install moulding and trim.
14.07 Install back splash on cabinet top and wall.
14.08 Install a cornice.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify and adopt acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Carpentry Skills

CODE NUMBER: Secondary 8722000 Postsecondary ______

Florida CIP 0646.021101

SECONDARY SCHOOL CREDITS __x__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30,31

CERTIFICATION COVERAGE: TEC CONSTR @ 7 G CARPENTRY @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as carpenter helpers (87105543), (869.664-014). The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, laying out, repairing, and fabricating and erecting residential wooden structures and fixtures using hand tools and power tools.

Listed below are the courses that comprise this program when offered at the secondary level:

8722010	Carpentry 1
8722020	Carpentry 2
8722030	Carpentry 3
8722040	Carpentry 4

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use of hand and power tools, selection and use of materials, estimating, and blueprint reading.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate shop and occupational safety skills.
02. Utilize hand tools.
03. Demonstrate knowledge of the construction industry.
04. Identify characteristics of construction lumber.
05. Utilize power tools.
06. Demonstrate proper handling and storage of materials.
07. Demonstrate knowledge of basic mathematics for carpentry.
08. Read blueprints.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Perform site preparation and layout activities.
12. Set up and use a transit and builder's level.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate understanding of basic science.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER: 8722000
PROGRAM TITLE: Carpentry Skills POSTSECONDARY NUMBER:

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Maintain a clean, orderly and safe work area.
01.02 Operate a fire extinguisher.
01.03 Identify basic first aid procedures.
01.04 Identify common safety hazards.
01.05 Interpret safety data sheets.

02.0 UTILIZE HAND TOOLS--The student will be able to:

02.01 Identify various handtools.
02.02 Select correct tool for job.
02.03 Demonstrate safe and proper use of handtools.
02.04 Read and use effectively, carpenters measuring tools.

03.0 DEMONSTRATE BASIC KNOWLEDGE OF THE CONSTRUCTION INDUSTRY--The student will be able to:

03.01 Describe the role of the construction industry within the free enterprise system.
03.02 Identify employment opportunities in the construction industry.

04.0 IDENTIFY CHARACTERISTICS OF CONSTRUCTION LUMBER--The student will be able to:

04.01 Identify the grades and species of lumber.
04.02 Identify the actual and nominal sizes of lumber.
04.03 Identify the grades of plywood.
04.04 Identify defects and blemishes that affect durability and strength in lumber.

05.0 UTILIZE POWER TOOLS--The student will be able to:

05.01 Identify power tools and machines.
05.02 Select the correct power tool according to the job.
05.03 Operate and care for power tools properly.

06.0 DEMONSTRATE PROPER HANDLING AND STORAGE--The student will be able:

06.01 Receive and store materials at a job site.
06.02 Identify common fasteners used in construction.

07.0 DEMONSTRATE KNOWLEDGE OF BASIC MATHEMATICS FOR CARPENTRY--The student will be able to:

07.01 Solve basic math problems related to carpentry applications.
07.02 Solve for square foot and cubic foot measurement.
07.03 Solve for board foot measurement.
07.04 Solve for linear foot measurement.
07.05 Read, interpret and apply metric conversion.
07.06 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.07 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

07.08 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.09 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.10 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 READ BLUEPRINTS--The student will be able to:

08.01 Read an architect's scale.
08.02 Identify architectural elevations and schedules.
08.03 Identify lines and blueprint symbols.
08.04 Interpret blueprints and specifications.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 PERFORM SITE PREPARATION AND LAYOUT ACTIVITIES--The student will be able to:

11.01 Identify building layout.
11.02 Erect batter boards and locate building lines.
11.03 Locate building line points on batter boards.
11.04 Locate building lines on a plot plan.
11.05 Square a building using the 6-8-10 method and the diagonal.

12.0 SET UP AND USE A TRANSIT AND BUILDER'S LEVEL--The student will be able to:

12.01 Set up and adjust transit or builders level over point and establish lines over two points.
12.02 Read the self-reading rod (positive and direct reading).
12.03 Perform differential leveling.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Carpentry Skills
PROGRAM NUMBER: 8722000
COURSE TITLE: Carpentry 1
COURSE NUMBER: 8722010

COURSE DESCRIPTION:

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Maintain a clean, orderly and safe work area.
01.02 Operate a fire extinguisher.
01.03 Identify basic first aid procedures.
01.04 Identify common safety hazards.
01.05 Interpret safety data sheets.

02.0 UTILIZE HAND TOOLS--The student will be able to:

02.01 Identify various handtools.
02.02 Select correct tool for job.
02.03 Demonstrate safe and proper use of handtools.
02.04 Read and use effectively, carpenters measuring tools.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Carpentry Skills
PROGRAM NUMBER: 8722000
COURSE TITLE: Carpentry 2
COURSE NUMBER: 8722020

COURSE DESCRIPTION:

03.0 DEMONSTRATE BASIC KNOWLEDGE OF THE CONSTRUCTION INDUSTRY--The student will be able to:

03.01 Describe the role of the construction industry within the free enterprise system.
03.02 Identify employment opportunities in the construction industry.

04.0 IDENTIFY CHARACTERISTICS OF CONSTRUCTION LUMBER--The student will be able to:

04.01 Identify the grades and species of lumber.
04.02 Identify the actual and nominal sizes of lumber.
04.03 Identify the grades of plywood.
04.04 Identify defects and blemishes that affect durability and strength in lumber.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Carpentry Skills
PROGRAM NUMBER: 8722000

COURSE TITLE: Carpentry 3
COURSE NUMBER: 8722030

COURSE DESCRIPTION:

05.0 UTILIZE POWER TOOLS--The student will be able to:

05.01 Identify power tools and machines.
05.02 Select the correct power tool according to the job.
05.03 Operate and care for power tools properly.

06.0 DEMONSTRATE PROPER HANDLING AND STORAGE--The student will be able:

06.01 Receive and store materials at a job site.
06.02 Identify common fasteners used in construction.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American

economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.

10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Carpentry Skills — PROGRAM NUMBER: 8722000

COURSE TITLE: Carpentry 4 — COURSE NUMBER: 8722040

COURSE DESCRIPTION:

07.0 DEMONSTRATE KNOWLEDGE OF BASIC MATHEMATICS FOR CARPENTRY--The student will be able to:

07.01 Solve basic math problems related to carpentry applications.
07.02 Solve for square foot and cubic foot measurement.
07.03 Solve for board foot measurement.
07.04 Solve for linear foot measurement.
07.05 Read, interpret and apply metric conversion.

08.0 READ BLUEPRINTS--The student will be able to:

08.01 Read an architect's scale.
08.02 Identify architectural elevations and schedules.
08.03 Identify lines and blueprint symbols.
08.04 Interpret blueprints and specifications.

11.0 PERFORM SITE PREPARATION AND LAYOUT ACTIVITIES--The student will be able to:

11.01 Identify building layout.
11.02 Erect batter boards and locate building lines.
11.03 Locate building line points on batter boards.
11.04 Locate building lines on a plot plan.
11.05 Square a building using the 6-8-10 method and the diagonal.

12.0 SET UP AND USE A TRANSIT AND BUILDER'S LEVEL--The student will be able to:

12.01 Set up and adjust transit or builders level over point and establish lines over two points.
12.02 Read the self-reading rod (positive and direct reading).
12.03 Perform differential leveling.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July 1993

PROGRAM TITLE: Chemical Instrumentation Technology

CODE NUMBER: Secondary Postsecondary _______

Florida CIP 0641.030101

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 _____9-12 ____ Postsecondary Adult Vocational

x Postsecondary Vocational ____ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a chemical instrumentation technician, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communications skills, leadership skills, human relations and employability skills, safe and efficient work practices, and assists chemists and chemical engineers in conducting chemical and physical laboratory tests for various purposes such as manufacturing production, and development of new products, materials, processing methods, and maintenance of health and safety standards.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in material handling, crushing, grinding, sizing, extraction, distillation, evaporation, drying, absorption, and heat transfer, as well as design, installation, and operation of chemical manufacturing processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: A training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving students is the attainment of an A.S. Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in chemical laboratory procedures.
02. Demonstrate proficiency in use of chemical analytical instruments.
03. Demonstrate proficiency in the use of computers to interface with chemical analytical instruments.
04. Demonstrate proficiency in the maintenance and repair of chemical analytical instruments.
05. Demonstrate proficiency in calibrating chemical analytical instruments.
06. Demonstrate an understanding of basic organic and inorganic chemistry.
07. Demonstrate proficiency in spectroscopy.
08. Demonstrate proficiency in chromatography.
09. Demonstrate proficiency in electron microscopy.
10. Demonstrate proficiency in nuclear magnetic resonance spectroscopy.
11. Demonstrate proficiency in qualitative and quantitative interpretation of numerical graphic output from chemical analysis instruments.
12. Demonstrate an understanding of the theory and function of chemical instruments and components, including high pressure and vacuum systems, cryogenics, mass spectrometers, and computer interfaces as used in instruments to analyze surface chemistry and organic and inorganic solutions and gases.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ____

PROGRAM TITLE: Chemical Instrumentation Technology POSTSECONDARY NUMBER: ____

01.0 DEMONSTRATE PROFICIENCY IN CHEMICAL LABORATORY PROCEDURES--The student will be able to:

01.01 Perform chemical extractions.
01.02 Perform gravimetric analysis.
01.03 Perform wet chemical analysis, including filtering, distilling, and titrating.
01.04 Use standard laboratory equipment, including pH meters, conductivity meters, and balances.
01.05 Perform record keeping.
01.06 Record uncertainties and calculate statistical uncertainties.
01.07 Follow all safety practices required for handling and disposal of chemicals.

02.0 DEMONSTRATE PROFICIENCY IN USE OF CHEMICAL ANALYTIC INSTRUMENTS--The student will be able to:

02.01 Identify the analytical applications of mass spectrometers, chromatographs, nuclear magnetic resonance spectrometers, and electron microscopes.
02.02 Introduce prepared gas or liquid samples into chromatographs and obtain quantitative chemical results.
02.03 Introduce prepared samples into nuclear magnetic spectrometers and obtain quantitative chemical results.
02.04 Introduce prepared samples into mass spectrometers and obtain quantitative chemical results.
02.05 Introduce prepared solid samples in electron microscopes and obtain results; use energy dispersive systems coupled with electronic microscopes to obtain qualitative surface chemistry analyses.

03.0 DEMONSTRATE PROFICIENCY IN THE USE OF COMPUTERS TO INTERFACE WITH CHEMICAL ANALYTICAL INSTRUMENTS--The student will be able to:

03.01 Describe how instrument output is collected and stored by the computer.
03.02 Collect, store, manipulate, and recall stored data from analytical instrument operations.
03.03 Create graphs and data tables using computer applications prepared for chemical analysis instruments.
03.04 Operate chromatographs, nuclear magnetic spectrometers, mass spectrometers, and electron microscopes using a computer interface.
03.05 Use computers to determine instruments status and to troubleshoot chemical analytical instruments.

04.0 DEMONSTRATE PROFICIENCY IN THE MAINTENANCE AND REPAIR OF CHEMICAL ANALYTICAL INSTRUMENTS--The student will be able to:

04.01 Perform cryogenic gas fills and cylinder changes.
04.02 Start systems after unplanned and planned down time.
04.03 Follow safety procedures in handling cryogenic gases.
04.04 Bring vacuum systems up and take vacuum systems down.
04.05 Maintain maintenance and use logs.

04.06 Perform maintenance to the gas systems, including plumbing lines, reattaching regulators.
04.07 Describe regulators and pressures.

05.0 DEMONSTRATE PROFICIENCY IN CALIBRATING CHEMICAL ANALYTICAL INSTRUMENTS--The student will be able to:

05.01 Adjust filament voltages to tune mass spectrometers.
05.02 Introduce standard compounds into gas chromatographs and change columns as needed to calibrate chromatograph.
05.03 Run computer checks, components checks, and system checks.
05.04 Adjust apertures and beam widths.
05.05 Identify various deuterated solvents, and their chemical shifts.
05.06 Recognize "spinning side bands" and ferromagnetic impurities.
05.07 Run QC/QA samples.

06.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ORGANIC AND INORGANIC CHEMISTRY--The student will be able to:

06.01 Explain molecular structure in terms of chemical bonding.
06.02 Apply stoichiometric relations to chemical equations.
06.03 Be able to write formulas of selected compounds from their names and vice versa.
06.04 Apply the principles of Charles', boyle's, Graham's and Dalton's laws.
06.05 Classify compounds into appropriate groups based on their properties.
06.06 Understand quantitative relationships to express solution concentrations.
06.07 Apply the principals of stereochemistry, stereoselectivity and stereospecificity.
06.08 Identify organic compounds through the interpretation of NMR, IR, C13NMR and Mass Spectroscopy.
06.09 Learn the concepts of enantiotopic and diastereotopic ligands faces.
06.10 Demonstrate an understanding research design and the ethical issues in scientific research.

07.0 DEMONSTRATE PROFICIENCY IN MASS SPECTROSCOPY--The student will be able to:

07.01 Prepare samples for introduction into a mass spectrometer.
07.02 Introduce samples into a mass spectrometer.
07.03 Obtain mass spectra of specific compounds using a mass spectrometer as a single instrument or as part of a gas chromatograph, ion trap chromatograph, or inductively coupled argon plasma system.
07.04 Calibrate mass spectrometers using appropriate calibration standards and by adjusting filament voltage.
07.05 Clean the ion source.
07.06 Perform maintenance on a mass spectrometer.
07.07 Perform trouble-shooting of a mass spectrometer as a single instrument or as part of a gas chromatograph, ion trap chromatograph, or inductively coupled argon plasma system.
07.08 Describe the abilities and limitations of chromatographs.
07.09 Describe the physics of mass spectrometry.
07.10 Describe the relationships between thin layer, column, paper, gas chromatograph, ion chromatograph, supercritical fluid chromatograph.

08.0 DEMONSTRATE PROFICIENCY IN CHROMATOGRAPHY--The student will be able to:

08.01 Prepare samples of introduction into a chromatograph.
08.02 Inject samples into a chromatograph.
08.03 Calibrate a chromatograph using appropriate calibration standards and by cleaning or changing columns.
08.04 Perform maintenance on a chromatograph, including changing cryogenic gas cylinders.
08.05 Perform trouble-shooting of a chromatograph.
08.06 Describe the capabilities and limitations of chromatography.
08.07 Describe the physics of chromatography.

09.0 DEMONSTRATE PROFICIENCY IN ELECTRON MICROSCOPY--The student will be able to:

09.01 Prepare samples for introduction into an electron microscope.
09.02 Introduce samples into an electron microscope, including closing and opening the electron gun, emptying and restoring vacuum, and placing the sample.
09.03 Obtain magnified images of organic and inorganic samples.
09.04 Obtain elemental analysis of the surface of samples using an energy dispersive system coupled to an electron microscope.
09.05 adjust aperture, beam width, voltage, and current to obtain optimum image resolution.
09.06 Calibrate an electron microscope and energy dispersive system.
09.07 Perform maintenance on an electron microscope and energy dispersive system, including gas fills.
09.08 Perform trouble-sheeting of an electron microscope and energy dispersive system.
09.09 Describe the mechanics of the electron gun, the vacuum system, and the sample stage.
09.10 Describe the physics of electron microscopy for image magnification and energy dispersion for elemental analysis.
09.11 Describe the relationships between resolution and aperture, beam width, voltage, magnifications, and current.

10.0 DEMONSTRATE PROFICIENCY IN NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY--The student will be able to:

10.01 Prepare samples for analysis with a nuclear magnetic spectrometer.
10.02 Place samples into the nuclear magnetic spectrometers, probe, and check spinner.
10.03 Adjust shim, field frequency, and local to obtain optimum resolution.
10.04 Calibrate a nuclear magnetic spectrometer, by locking to appropriate solvent.
10.05 Perform maintenance on a nuclear magnetic spectrometer, including changing cryogenic gas cylinders.
10.06 Perform trouble-shooting of a nuclear magnetic spectrometer.
10.07 Describe the abilities and limitations of nuclear magnetic spectrometers.
10.08 Describe the physics of nuclear magnetic spectrometers.
10.09 Describe the relationships between sample size, and 60-500 MHz instruments.

11.0 INTERPRET QUANTITATIVE AND GRAPHIC OUTPUT FROM CHEMICAL ANALYSIS INSTRUMENTS--The student will be able to:

11.01 Identify elements and/or chemical compounds present in a sample from graphic output.
11.02 Identify relative concentrations of chemical elements and/or compounds present in a sample from graphic output.
11.03 Quantify results of chemical analyses using numerical output.
11.04 Use statistics to record uncertainties.

11.05 Prepare written reports of results.

12.0 DEMONSTRATE AN UNDERSTANDING OF THE THEORY AND FUNCTION OF CHEMICAL INSTRUMENTS AND COMPONENTS, INCLUDING HIGH PRESSURE AND VACUUM SYSTEMS, CRYOGENICS, MASS SPECTROMETERS, AND COMPUTER INTERFACES AS USED IN INSTRUMENTS TO ANALYZE SURFACE CHEMISTRY AND ORGANIC AND INORGANIC SOLUTIONS AND GASES--The student will be able to:

12.01 Describe the use of vacuum systems in modern laboratory applications.
12.02 Demonstrate an understanding of the theory and operation of infrared, nuclear magnetic resonance, gas chromatograph/mass spectrometers scanning electron microscopes, and Atomic absorption.
12.03 Describe current applications and limitations for each analytical instrument in industry.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Chemical Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0641.030100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

___x___ Postsecondary Vocational _____Other ________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as chemical technicians (24505236), chemical engineering technicians (008.261-010), chemical laboratory technicians (022.261-010), scientific helpers (199.364-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and assists chemists and chemical engineers in conducting chemical and physical laboratory tests for various purposes such as manufacturing production, and the development of new products, materials, processing methods, and maintenance of health and safety standards.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in material handling, crushing, grinding, sizing, extraction, distillation, evaporation, drying, absorption, and heat transfer, as well as design, installation, and operation of chemical manufacturing processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate laboratory safety procedures.
02. Demonstrate basic laboratory skills.
03. Set up and operate laboratory equipment and instruments.
04. Perform basic laboratory calculations and measurements.
05. Provide maintenance of equipment and supplies.
06. Perform analysis procedures on food substances.
07. Perform air and water analysis procedures.
08. Read and interpret technical reports.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Chemical Technology
POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE LABORATORY SAFETY PROCEDURES--The student will be able to:

01.01 Select safety supplies appropriate to task.
01.02 Operate safety equipment to provide personal and environmental safety.
01.03 Apply procedures to handle hazardous reagents, hot materials, sharp objects, and contaminating materials.
01.04 Utilize and identify appropriate safety clothing.

02.0 DEMONSTRATE BASIC LABORATORY SKILLS--The student will be able to:

02.01 Select appropriate glassware for task.
02.02 Weigh chemical reagents to prepare solutions or stains.
02.03 Mix chemicals to prepare reagents, solutions or stains.
02.04 Store prepared solutions and stains to maintain optimal condition.
02.05 Test solution with pH paper.
02.06 Determine percentage of alcohol reagents in a solution.
02.07 Filter substances to obtain residues.
02.08 Titrate solutions to obtain level of ph.

03.0 SET UP AND OPERATE LABORATORY EQUIPMENT AND INSTRUMENTS--The student will be able to:

03.01 Operate pH meter.
03.02 Operate compound microscope.
03.03 Utilize oil immersion lens.
03.04 Operate Bunsen/Fisher burner safely.
03.05 Calibrate burette to prepare cure.
03.06 Operate balance scale.
03.07 Operate centrifuge.
03.08 Operate timing device.
03.09 Utilize autoclaves, hot air oven, and disinfectants.
03.10 Operate sound level measuring devices.
03.11 Operate a turbidimeter.
03.12 Operate gas chromatograph.
03.13 Operate technicon analyzer.

04.0 PERFORM BASIC LABORATORY CALCULATIONS AND MEASUREMENTS--The student will be able to:

04.01 Calculate quantities needed to perform a test analysis.
04.02 Measure volume of a solution to perform a laboratory test.
04.03 Measure length of an area in metrics.
04.04 Measure temperatures accurately.

05.0 PROVIDE MAINTENANCE OF EQUIPMENT AND SUPPLIES--The student will be able to:

05.01 Wash laboratory equipment appropriately.
05.02 Sterilize equipment to decontaminate soiled materials.
05.03 Inventory supplies and equipment.
05.04 Prepare equipment appropriately for tests.
05.05 Ensure optimal working condition of equipment and devices.

06.0 PERFORM ANALYSIS PROCEDURES ON FOOD SUBSTANCES--The student will be able to:

06.01 Describe the cultivation and growth of microorganisms.
06.02 Perform a standard plate count.
06.03 Examine microbiology.
06.04 Identify sources of contamination.
06.05 Perform a yeast and mold count.
06.06 Test food for disease.
06.07 Count bacteria using microscope.
06.08 Identify principles of food preparation.
06.09 Describe controlled atmosphere storage.
06.10 Perform heat sterilization techniques.
06.11 Evaluate containers.
06.12 Describe preparatory treatments for food.
06.13 Identify quality attributes.
06.14 Perform sediment test.
06.15 Evaluate pasteurization using phosphate test.
06.16 Define properties of sanitation of substances.

07.0 PERFORM AIR AND WATER ANALYSIS PROCEDURES--The student will be able to:

07.01 Describe characteristics of protists.
07.02 Determine emission rate using EPA methods.
07.03 Sample and analyze oxides in gases.
07.04 Describe pollution control practices.
07.05 Describe measurements of flow rates.
07.06 Analyze water using portable test kit.
07.07 Measure concentration of metals in water.
07.08 Perform toxicity test.
07.09 Determine oxygen demand and waste water out flows using standard methods.
07.10 Determine oil and grease concentration in wastewater outflow.
07.11 Describe characteristics of wastewater.
07.12 Apply federal pollution regulations.
07.13 Analyze properties of solids and liquids.

08.0 READ AND INTERPRET TECHNICAL REPORTS--The student will be able to:

08.01 Define chemical terms.
08.02 Identify chemical abbreviations.
08.03 Interpret chemical equations and specifications.
08.04 Analyze graphs and charts.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Civil Drafting Skills

CODE NUMBER: Secondary 8725000 Postsecondary _______

Florida CIP 0648.010103

SECONDARY
SCHOOL CREDITS 2 COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 X 9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DRAFTING @ 7 G TEC DRAFT @ 7 G
¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230) or junior civil drafters.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint machine operation, use of drafting tools and equipment, drafting skills, charts and graphs, computer aided drawings, and technical mathematics.

Listed below are the courses that comprise this program when offered at the secondary level:

8725010	Civil Drafting Skills 1
8725020	Civil Drafting Skills 2

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, drafting tools, CAD systems, drafting tracks and blueprint machine materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Completion of the Drafting Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization area concurrently may be necessary.

Approximately 250 hours should be spent utilizing CAD systems.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare civil drawings.
02. Prepare advanced civil drawings.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8725000

PROGRAM TITLE: Civil Drafting Skills
POSTSECONDARY NUMBER:

01.0 PREPARE CIVIL DRAWINGS--The student will be able to:

01.01 Prepare drainage drawings.
01.02 Prepare plan and profile drawings.
01.03 Prepare highway drawings.
01.04 Produce drawings manually and electronically.

02.0 PREPARE ADVANCED CIVIL DRAWINGS--The student will be able to:

02.01 Solve trigonometric problems.
02.02 Prepare plot and plat plans.
02.03 Prepare street layout drawings.
02.04 Prepare topographic drawings.
02.05 Produce advanced drawings manually and electronically.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　COURSE CREDIT: 1

PROGRAM TITLE: Civil Drafting Skills　　PROGRAM NUMBER: 8725000

COURSE TITLE: Civil Drafting Skills 1　　COURSE NUMBER: 8725010

COURSE DESCRIPTION:

01.0 PREPARE CIVIL DRAWINGS--The student will be able to:

01.01 Prepare drainage drawings.
01.02 Prepare plan and profile drawings.
01.03 Prepare highway drawings.
01.04 Produce drawings manually and electronically.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Civil Drafting Skills	PROGRAM NUMBER:	8725000
COURSE TITLE:	Civil Drafting Skills 2	COURSE NUMBER:	8725020

COURSE DESCRIPTION:

02.0 PREPARE ADVANCED CIVIL DRAWINGS--The student will be able to:

02.01 Solve trigonometric problems.
02.02 Prepare plot and plat plans.
02.03 Prepare street layout drawings.
02.04 Prepare topographic drawings.
02.05 Produce advanced drawings manually and electronically.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Civil/Structural Drafting

CODE NUMBER: Secondary _______ Postsecondary I480103

Florida CIP 0648.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230), structural drafters (005.281-014) or civil drafters (005.281-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, mathematical, safe and efficient work practices, use of technical manuals and technical data; calculation of reactions and stresses; interpretation of codes and specifications; structural steel detailing, concrete reinforcing details, computer-aided drawings, and development of detailed construction drawings, topographical profiles, and specifications for use in planning and constructing highways, plants, and structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, office reproduction equipment, drafting tools, computer assisted design systems, technical publications and reference materials, and drafting. materials/supplies common to industry

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is one of many appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Completion of the 900 hour core Drafting program is a prerequisite for entry into this postsecondary specialization program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is:

Mathematics 9.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of the program for the average achieving student is 750 hours in addition to completion of the core Drafting program.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare basic architectural drawings.
02. Prepare structural details.
03. Prepare map drawings.
04. Prepare civil drawings.
05. Prepare structural steel drawings.
06. Prepare reinforced concrete drawings.
07. Prepare structural wood drawings.
08. Prepare advanced computer aided drawings, two-dimensional and three-dimensional.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: _________

PROGRAM TITLE: Civil-Structural Drafting POSTSECONDARY NUMBER: I480103

01.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to.

01.01 Interpret vendors catalogs and technical tables.
01.02 Prepare floor plan drawings, with dimensions.
01.03 Prepare foundation plan and detail drawings, with dimensions.

02.0 PREPARE STRUCTURAL DETAILS--The student will be able to.

02.01 Interpret structural steel and reinforced concrete, and timber manuals and technical tables.
02.02 Draw structural connections.
02.03 Draw reinforcing bar details.

03.0 PREPARE MAP DRAWINGS--The student will be able to.

03.01 Prepare traverse drawings.
03.02 Prepare plat drawings.
03.03 Prepare street layout drawings.
03.04 Prepare map drawings.

04.0 PREPARE CIVIL DRAWINGS--The student will be able to.

04.01 Prepare topographic drawings.
04.02 Prepare drainage drawings.
04.03 Prepare highway drawings.

05.0 PREPARE STRUCTURAL STEEL DRAWINGS--The student will be able to.

05.01 Use the "Manual of Steel Construction" and other technical data.
05.02 Interpret codes and specifications.
05.03 Calculate reactions and stresses.
05.04 Prepare shear and moment diagrams.
05.05 Detail bolted connections.
05.06 Detail welded connections.
05.07 Prepare erection plans and schedules.
05.08 Assist in the preparation of bids.
05.09 Prepare advance bill for ordering materials.

06.0 PREPARE REINFORCED CONCRETE DRAWINGS--The student will be able to.

06.01 Use the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" and other technical data.
06.02 Interpret codes and specifications.
06.03 Interpret engineering drawings.
06.04 Prepare column detail drawings.
06.05 Prepare footing and foundation drawings.
06.06 Prepare floor and roof detail drawings.
06.07 Prepare special structure detail drawings.
06.08 Prepare bar lists and schedules.

07.0 PREPARE STRUCTURAL WOOD DRAWINGS--The student will be able to.

07.01 Use the "Timber Construction Manual".
07.02 Interpret codes and specifications.
07.03 Prepare fastening and connection details.
07.04 Prepare shear and moment diagrams.

07.05 Prepare framing plans.
07.06 Assist in the preparation of bids.
07.07 Prepare advance bill for ordering materials.

08.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS, TWO-DIMENSIONAL AND THREE DIMENSIONAL--The student will be able to:

07.01 Produce architectural drawings.
07.02 Produce structural (steel, wood, reinforced concrete) drawings.
07.03 Produce map drawings.
07.04 Produce civil drawings.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Clock and Watch Repair

CODE NUMBER: Secondary ______ Postsecondary I470408

Florida CIP 0647.040800

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): ____7-9 ____9-12 X Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: WATCH REPR @ 7 G INSTRMENT @ 7 G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students or employment as watchmakers (85917655), watch repairers, (715.381-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, manufacturing, maintaining, and repairing clocks, watches, chronometers and other time measuring devices by diagnosing malfunctions, disassembling, repairing, and/or replacing faulty parts; cleaning, assembling, and adjusting parts, and replacing straps, bands, crystals, crown, and hands.

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in the use of bench and hand tools including lathes, staking tools, loupes, truing calipers, timing machines, pallet warmers and other grinding, drilling, and polishing tools. Experience in the use of various materials as metals, plastics, chemicals, oils, waxes and abrasives is included.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1350 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Identify timepieces.
02. Repair mechanical timepieces.
03. Repair power units.
04. Maintain and repair the train of wheels.
05. Maintain and repair jewelled escapements.
06. Maintain and repair balance wheel.
07. Repair dial trains.
08. Repair clock cases and glasses.
09. Regulate and adjust timepieces.
10. Test electronic timepieces.
11. Perform sales and shop management skills.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Clock and Watch Repair POSTSECONDARY NUMBER: I470408

01.0 IDENTIFY TIMEPIECES--The student will be able to:

01.01 Identify types and theory of timepieces.
01.02 Describe timepiece parts and their functions.

02.0 REPAIR MECHANICAL TIMEPIECES--The student will be able to:

02.01 Disassemble and inspect timepiece.
02.02 Make repair parts using jeweler's lathe.
02.03 Repair timepiece.
02.04 Clean timepiece.
02.05 Assemble time train.
02.06 Assemble dial train.
02.07 Synchronize and test timepiece.

03.0 REPAIR POWER UNITS--The student will be able to:

03.01 Disarm mainspring.
03.02 Repair or replace mainspring.
03.03 Inspect and replace cables and/or weights.
03.04 Repair or replace barrel piece and cover.

04.0 MAINTAIN AND REPAIR TRAIN OF WHEELS--The student will be able to:

04.01 Make gears using gear cutter.
04.02 Straighten pivots and gears.
04.03 Re-pivot arbors and replace teeth or gears.
04.04 Replace jewel/bushing in timepiece.

05.0 MAINTAIN AND REPAIR JEWELED ESCAPEMENT--The student will be able to:

04.01 Repair and adjust timepiece escapement.

06.0 MAINTAIN AND REPAIR BALANCE WHEEL--The student will be able to:

06.01 Replace friction and rivet-type balance staff.
06.02 True balance wheel.
06.03 Poise balance wheel.

07.0 REPAIR DIAL TRAIN--The student will be able to:

07.01 Repair and adjust dial train.
07.02 Repair setting mechanism.
07.03 Repair and adjust winding mechanism.

08.0 REPAIR CLOCK CASES AND GLASSES--The student will be able to:

08.01 Repair clock cases and glasses.

09.0 REGULATE AND ADJUST TIMEPIECES--The student will be able to:

09.01 Regulate and adjust timing.
09.02 Regulate electronic piece.

10.0 TEST ELECTRONIC TIMEPIECES--The student will be able to:

10.01 Test electronic quartz crystal timepiece.
10.02 Replace gasket in quartz crystal timepiece.
10.03 Replace batteries in quartz crystal timepiece.

11.0 PERFORM SALES AND SHOP MANAGEMENT SKILLS--The student will be able to:

11.01 Perform salesmanship skills.
11.02 Perform shop management skills.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as

recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:
16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial and Industrial Electricity

CODE NUMBER: Secondary _______ Postsecondary I470119

Florida CIP 0647.019902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): _____7-9 _____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30.31

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians (87202549), industrial electricians (826.361-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: assembly, installation, operation, maintenance and repair of electrical or electronic equipment used in industry and manufacturing.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry. Students are also instructed in the following: residential, industrial and commercial wiring; servicing, maintaining and using equipment which includes lighting, motors, conduit (raceway) systems and related equipment in accordance with the National Electrical Code; and hydraulic, pneumatic and electronic controls and alarm systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated

basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate industrial wiring skills.
05. Install transformers.
06. Operate AC and DC rotating equipment.
07. Construct control circuits and install electrical controls and devices.
08. Repair motors.
09. Demonstrate proficiency in electronic components and circuits.
10. Demonstrate proficiency in basic logic circuits.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Commercial and Industrial Electricity POSTSECONDARY NUMBER: I470119

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures.
01.02 Apply laboratory safety rules and procedures.
01.03 Demonstrate the operation of laboratory safety devices.
01.04 Demonstrate personal safety procedures.
01.05 Demonstrate first aid and emergency treatment procedures.
01.06 Apply fire safety rules and procedures.
01.07 Apply electrical safety rules and procedures.
01.08 Demonstrate procedures for a disaster situations.
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers.
01.10 Solve problems requiring addition, subtraction, multiplication and division of common fractions.
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers.
01.12 Convert decimals to fractions and fractions to decimals.
01.13 Convert English measure to metric measure and metric measure to English measure.
01.14 Solder and desolder components.
01.15 Drill holes in metal or plastic chassis.
01.16 Measure voltage in a simple circuit.
01.17 Measure amperage in a simple circuit.
01.18 Measure resistance in a simple circuit.
01.19 Produce voltage by chemical means.
01.20 Produce voltage by mechanical means.
01.21 Produce voltage by thermal means.
01.22 Produce voltage by photoelectric means.
01.23 Identify physical and mechanical abilities of the electrical trade.
01.24 Demonstrate use and care of ladders.
01.25 Demonstrate use and care of tools.
01.26 Demonstrate use of shovels and axes.
01.27 Prepare a trench for conduit.
01.28 Backfill and compact a conduit trench.
01.29 Organize storage areas on site.
01.30 Demonstrate service truck loading procedures.
01.31 Perform daily maintenance on service trucks.
01.32 Demonstrate rigging procedures using ropes, cables and chains.
01.33 Identify use of rigging hand signals for crane operators.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity and electronics (prerequisite to DC).
02.02 Relate electricity to the nature of matter.
02.03 Identify sources of electricity.
02.04 Define voltage, current, resistance, power and energy.
02.05 Apply and relate Ohm's Law.
02.06 Measure properties of a circuit using volt-ohm meters (VOM) and digital volt-ohm meters (DVM) meters.
02.07 Compute and measure conductance and resistance of conductors and insulators.

02.08 Analyze series circuits.
02.09 Construct series circuits.
02.10 Troubleshoot series circuits.
02.11 Draw a series circuit and calculate circuit values.
02.12 Analyze parallel circuits.
02.13 Construct parallel circuits.
02.14 Troubleshoot parallel circuits.
02.15 Draw a parallel circuit and calculate circuit values.
02.16 Analyze series-parallel circuits.
02.17 Construct series-parallel circuits.
02.18 Troubleshoot series-parallel circuits.
02.19 Draw a series-parallel circuit and calculate circuit values.
02.20 Define magnetic properties of circuits and devices.
02.21 Determine physical and electrical characteristics of capacitors and inductors.
02.22 Setup and operate a VOM for DC circuits.
02.23 Setup and operate a DVM for DC circuits.
02.24 Setup and operate power supplies for DC circuits.
02.25 Setup and operate power supplies for DC circuits.
02.26 Construct a simple DC generator.
02.27 Construct a simple DC motor.
02.28 Analyze and measure inductive-reactance (R-L) and reactive-capacitance (R-C) time constants.
02.29 Setup and operate oscilloscopes for DC circuits.
02.30 Analyze filter circuits.
02.31 Construct filter circuits.
02.32 Troubleshoot filter circuits.
02.33 Setup and operate frequency counters for Dc circuits.
02.34 Setup and operate signal generators for DC circuits.
02.35 Setup and operate capacitor and inductor analyzers for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and apply principles of transformers to AC circuits.
03.05 Analyze polyphase circuits.
03.06 Construct polyphase circuits.
03.07 Troubleshoot polyphase circuits.
03.08 Analyze basic motor theory and operation.
03.09 Analyze basic generator theory and operation.
03.10 Setup and operate a VOM for AC circuits.
03.11 Setup and operate a DVM for AC circuits.
03.12 Setup and operate power supplies for AC circuits.
03.13 Analyze and measure AC signals using oscilloscope, frequency meters and generators.
03.14 Analyze AC capacitive circuits.
03.15 Construct AC capacitive circuits.
03.16 Troubleshoot AC capacitive circuits.
03.17 Analyze AC inductive circuits.
03.18 Construct AC inductive circuits.
03.19 Troubleshoot AC inductive circuits.
03.20 Analyze resistance inductance capacitance (RLC) circuits (series, parallel, complex).
03.21 Construct RLC circuits (series, parallel, complex).
03.22 Troubleshoot RLC circuits (series, parallel, complex).
03.23 Analyze series and parallel resonant circuits.
03.24 Construct series and parallel resonant circuits.

03.25 Troubleshoot series and parallel resonant circuits.
03.26 Setup and operate impedance bridges for AC circuits.
03.27 Display and read waveforms.
03.28 Insert a capacitor in series in an AC circuit.
03.29 Develop a time constant curve.
03.30 Insert inductors in series in an AC circuit.
03.31 Construct a series RL circuit.
03.32 Measure voltage across a resistor and an inductor at varying frequencies in a series RL circuit.
03.33 Measure voltage across a resistor and an inductor at various values of resistance in a series RL circuit.
03.34 Measure voltage across a resistor and an inductor at various values of inductance in a series RL circuit.
03.35 Construct a parallel RL circuit.
03.36 Measure current through a resistor and an inductor at varying frequencies in a parallel RL circuit.
03.37 Measure current through a resistor and an inductor at various values of resistance in a parallel RL circuit.
03.38 Measure current through a resistor and an inductor at various values of inductance in a parallel RL circuit.
03.39 Construct a series RC circuit.
03.40 Measure voltage across a resistor and a capacitor at varying frequencies in a series RC circuit.
03.41 Measure voltage across a resistor and a capacitor at various values of resistance in a series RC circuit.
03.42 Measure voltage across a resistor and a capacitor at various values of capacitance in a series RC circuit.
03.43 Construct a parallel RC circuit.
03.44 Measure current through a resistor and a capacitor at varying frequencies in a parallel RC circuit.
03.45 Measure current through a resistor and a capacitor at various values of resistance in a parallel RC circuit.
03.46 Measure current through a resistor and a capacitor at various values of capacitance in a parallel RC circuit.
03.47 Construct a series RLC circuit.
03.48 Measure voltage across a resistor, a capacitor and an inductor at varying frequencies in a series RLC circuit.
03.49 Measure voltage across a resistor, a capacitor and an inductor at various values of resistance in a series RLC circuit.
03.50 Measure voltage across a resistor, a capacitor and an inductor at various values of capacitance in a series RLC circuit.
03.51 Measure voltage across a resistor, a capacitor and an inductor at various values of inductance in a series RLC circuit.
03.52 Construct a parallel RLC circuit.
03.53 Measure current through a resistor, a capacitor and an inductor at varying frequencies in a parallel RLC circuit.
03.54 Measure current through a resistor, a capacitor and an inductor at various values of resistance in a parallel RLC circuit.
03.55 Measure current through a resistor, a capacitor and an inductor at various values of capacitance in a parallel RLC circuit.
03.56 Measure current through a resistor, a capacitor and an inductor at various values of inductance in a parallel RLC circuit.
03.57 Read and interpret color codes to identify resistors.
03.58 Analyze voltage dividers (loaded and unloaded).
03.59 Construct voltage dividers (loaded and unloaded).
03.60 Troubleshoot voltage dividers (load and unloaded).
03.61 Solve network theorem problems using Kirchoff, (V and I), Thevenin, Norton, Superposition and Delta-Wye.
03.62 Analyze maximum power transfer theory.
03.63 Construct maximum power transfer theory.
03.64 Troubleshoot maximum power transfer theory.

04.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation requirements from an industrial electrical plan or drawing.
04.02 Draw an industrial electrical floor plan.
04.03 Charge a lead-acid battery.
04.04 Charge a nickel-caladium battery.
04.05 Repair an emergency lighting system.
04.06 Install circuit breakers in a panel board.
04.07 Install and connect system grounds.
04.08 Install a distribution panel board.
04.09 Install electrical metallic tubing.
04.10 Install explosion proof equipment.
04.11 Install power and controls for air conditioning systems.
04.12 Install a fluorescent lighting fixture.
04.13 Install an incandescent lighting fixture.
04.14 Install a lighting dimmer system.
04.15 Install liquid-tight flexible metal conduit.
04.16 Install multiconductor cable.
04.17 Install a multiconduit layout.
04.18 Install a multicontrol lighting circuit.
04.19 Install nonliquid-tight flexible metal conduit.
04.20 Install plastic conduit.
04.21 Install rigid conduit.
04.22 Install the service entrance head for a service drop.
04.23 Install under floor duct work.
04.24 Install an underground service entrance.
04.25 Install an underground service entrance.
04.26 Complete an equipment and material order.
04.27 Receive and equipment and material order.
04.28 Correct the power factor on a system.
04.29 Install a bus duct.
04.30 Install bundled wiring in mounted lay-in duct work.
04.31 Install a circuit using nonmetallic sheathed cable.
04.32 Install plug-in duct work.
04.33 Install a power feeder wiring system to machinery.
04.34 Install a public address system.
04.35 Install analog systems.
04.36 Install digital communications cabling.
04.37 Install fiber optics communications cabling.
04.38 Install and terminate high-voltage cable.
04.39 Operate high-voltage test equipment.
04.40 Use a megger (test kit) to test insulation.

05.0 INSTALL TRANSFORMERS--The student will be able to:

05.01 Connect a single-phase step-down transformer.
05.02 Connect a single-phase step-up transformer.
05.03 Connect two single-phase transformers in parallel.
05.04 Connect two single-phase transformers in an open-delta configuration.
05.05 Connect a dual-voltage transformer (for high-voltage input and output)
05.06 Connect a dual-voltage transformer (for low-voltage input and output).
05.07 Connect an auto transformer to give a variety of output voltages.
05.08 Connect a single-phase distribution transformer to supply 115 and 230 volts.
05.09 Connect a three-phase power transformer for a three-phase, four-wire connection.
05.10 Connect a three-phase transformer for a three-phase, delta configuration.

05.11 Connect a three-phase power transformer for a three-phase, wye configuration.
05.12 Connect three single-phase transformers to form a delta-delta configuration.
05.13 Connect three single-phase transformers to form a delta-star configuration.
05.14 Connect three single-phase transformers to form a star-delta three-phase configuration.
05.15 Connect three single-phase transformers to form a star-star, three-phase configuration.
05.16 Install a current transformer and measure current flow.
05.17 Install a potential transformer and measure voltage.
05.18 Connect a booster transformer.
05.19 Connect a bucking transformer.

06.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

06.01 Connect a DC shunt motor.
06.02 Connect a DC series motor.
06.03 Connect a DC compound motor.
06.04 Connect a DC separately-excited shunt generator.
06.05 Connect a DC self-excited shunt generator.
06.06 Connect a DC compound generator.
06.07 Connect a DC series generator.
06.08 Connect a capacitor-start motor.
06.09 Connect a split-phase induction motor.
06.10 Connect a capacitor-run motor.
06.11 Connect a universal motor.
06.12 Connect a repulsion-start, induction-run motor.
06.13 Connect a three-phase wound-rotor induction motor.
06.14 Connect a three-phase squirrel cage induction motor.
06.15 Connect a three-phase synchronous motor.
06.16 Connect a three-phase alternator.

07.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

07.01 Draw an elementary motor-control line diagram.
07.02 Install a manual motor-control station.
07.03 Install an automatic, push-button motor-control station.
07.04 Install a three-phase-control magnetic starter.
07.05 Install a two-station, push-button control station.
07.06 Install a drum-switch control station.
07.07 Install a control circuit to change the direction of rotation of a motor.
07.08 Install a hands-off, automatic control circuit.
07.09 Install a multiple push-button station.
07.10 Install an interlocking and reversing control circuit.
07.11 Install a hand sequence control circuit.
07.12 Install an AC reduced voltage starter (resistance).
07.13 Install a part winding starter.
07.14 Install a three-phase multispeed controller.
07.15 Install a direct current motor controller.
07.16 Install a timed sequence control circuit.
07.17 Install an automatic sequence control circuit.
07.18 Connect a pilot-motor-driven motor timing control.
07.19 Connect a capacitor timing starter.
07.20 Install a jogging control circuit.
07.21 Install a plugging control circuit.
07.22 Install an electric breaking device.
07.23 Install a direct drive station.
07.24 Install a gear motor station.

07.25 Construct a linear voltage regulator.
07.26 Construct a switching voltage regulator.
07.27 Construct an electronic wiring circuit.
07.28 Construct a photoelectric relay circuit.
07.29 Construct an operational amplifier circuit.
07.30 Construct a transistor speed control circuit.
07.31 Construct a closed-loop speed control circuit.
07.32 Construct a pulse-width speed control circuit.
07.33 Construct a triac speed control circuit.
07.34 Operate digital control systems for computer control systems.
07.35 Install solid-state motor control systems.
07.36 Install digital control systems (computer systems).
07.37 Construct a basic silicon controlled rectifier (SCR) speed control circuit.
07.38 Construct a pulse-triggered SCR speed control circuit.
07.39 Construct a closed-loop SCR speed control circuit.
07.40 Construct a tachometer-feedback speed control circuit.

08.0 REPAIR MOTORS--The student will be able to:

08.01 Disassemble and assemble a DC motor.
08.02 Disassemble and assemble a single-phase motor.
08.03 Disassemble and assemble a three-phase motor.
08.04 Prepare a motor data card.
08.05 Wind a DC motor.
08.06 Wind a single-phase motor.
08.07 Wind a three-phase motor.
08.08 Install and connect a motor starting switch.
08.09 Install a motor centrifugal mechanism.
08.10 Install motor bearings and bushings.
08.11 Troubleshoot and repair a DC motor.
08.12 Troubleshoot and repair a single-phase motor.
08.13 Troubleshoot and repair a three-phase motor.

09.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC COMPONENTS AND CIRCUITS--The student will be able to:

09.01 Test semiconductor diodes.
09.02 Test thyristors.
09.03 Test bipolar transistors.
09.04 Test unijunction transistors.
09.05 Test circuit protection devices.
09.06 Construct a half-wave low-voltage power supply circuit.
09.07 Construct a full-wave low-voltage power supply circuit.
09.08 Construct a full-wave low-voltage regulated power supply circuit.
09.09 Construct a full-wave bridge-rectifier power supply circuit.
09.10 Construct a unijunction transistor relaxation oscillator circuit.

10.0 DEMONSTRATE PROFICIENCY IN BASIC LOGIC CIRCUITS--The student will be able to:

10.01 Convert decimal numbers to binary numbers.
10.02 Convert decimal numbers to octal numbers.
10.03 Solve problems using Boolean algebra.
10.04 Construct a NOR gate circuit.
10.05 Construct an exclusive OR gate circuit.
10.06 Construct an RS and steered flip-flop.
10.07 Construct a J-K flip-flop.
10.08 Construct a logic counter circuit.
10.09 Construct a logic addition and subtraction circuit.
10.10 Construct a logic multiplication and division circuit.
10.11 Construct a logic memory circuit.

10.12 Construct an AND gate circuit.
10.13 Construct an OR gate circuit.
10.14 Construct an inverter circuit.
10.15 Construct an NAND gate circuit.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Art

CODE NUMBER: Secondary ______ Postsecondary I480203

Florida CIP 0648.020300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: COMM ART @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students or employment as artists and related workers (34035178), illustrators 141.061-022), commercial designers (141.081-014). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: basic art skills; lettering skills; preparation of layouts and illustrations; preparation of camera ready paste-up; and development of specialized skills.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: lettering signs, layout and design for advertising art, airbrush for illustrations, photo retouching and custom work.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1290 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate basic commercial art knowledge.
02. Demonstrate proficiency in graphic production.
03. Demonstrate proficiency in technical art skills.
04. Demonstrate proficiency in design skills.
05. Demonstrate proficiency in lettering skills.
06. Demonstrate an understanding of typography.
07. Demonstrate proficiency in layout and paste-up.
08. Demonstrate proficiency in illustration skills.
09. Demonstrate proficiency in applied design.
10. Demonstrate proficiency in photostat camera skills.
11. Demonstrate proficiency in airbrush skills.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Commercial Art POSTSECONDARY NUMBER: I480203

01.0 DEMONSTRATE BASIC COMMERCIAL ART KNOWLEDGE--The student will be able to:

01.01 Take notes, listen and comply with instructions.
01.02 Read instructions thoroughly.
01.03 Request clarification of instructions (ask questions).
01.04 Relay instructions to others orally and in writing.
01.05 Define and explain commercial art terms.
01.06 Document job tasks, costs and maintain records.
01.07 Make project presentations.
01.08 Interact with the employer, fellow employees and customers.

02.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

02.01 Define the differences in production processes and estimate relative costs.
02.02 Recognize limitations for printing.
02.03 Identify and select different printing surfaces.
02.04 Identify and select appropriate printing inks.
02.05 Identify and select finishing processes.
02.06 Identify standard industry material sizes.
02.07 Specify types of folds.

03.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

03.01 Explain care and respect for all tools and equipment.
03.02 Make computations for centering, spacing and scaling drawings.
03.03 Draw on various types of drafting media.
03.04 Interpret information from drawings, prints and sketches.
03.05 Draw freehand sketches.
03.06 Draw auxiliary views.
03.07 Draw a one and two point perspective.
03.08 Make corrections on a drawing.
03.09 Draw in ink on a variety of surfaces.
03.10 Develop a glossary of technical terms.
03.11 Analyze an object to determine size and shape.
03.12 Draw an oblique drawing.
03.13 Draw an isometric drawing.
03.14 Read and interpret technical charts, graphs and diagrams.
03.15 Evaluate a drawing.
03.16 Make an orthographic drawing using a computer-assisted drafting (CAD) system as an individual or team member.
03.17 Make a print on a plotter.

04.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

04.01 Explain proper use and care of tools.
04.02 Apply principles and elements of design.
04.03 Apply color theory (pigment versus light).
04.04 Utilize tones, hues and values.
04.05 Sketch designs using pencil and ink.
04.06 Paint freehand or within sketched designs using mixed colors or apply colors to produce desired shades.
04.07 Apply color for impact (color psychology).

04.08 Differentiate between line halftone, duotone and four-color process.
04.09 Demonstrate balance in design.
04.10 Demonstrate designs with symmetry and asymmetry.
04.11 Develop grids for layouts of magazine pages, ads, etc.
04.12 Paint decorative freehand designs and objects.
04.13 Use palette knife or brush to mix colors.
04.14 Create designs by stripping.
04.15 Demonstrate harmony and contrast of line and shape.
04.16 Demonstrate harmony and contrast of color and tone.
04.17 Demonstrate harmony and contrast of proportion.
04.18 Demonstrate harmony and contrast of texture pattern.
04.19 Demonstrate harmony and contrast of motion.
04.20 Indicate style appropriate to desired impact.
04.21 Make a collage.

05.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to:

05.01 Demonstrate use and care of tools, lettering pens, t-squares and triangles.
05.02 Identify and select lettering styles.
05.03 Perform and use pen, brush, pencil and LeRoy lettering.
05.04 Utilize guidelines, margins and spacing for layouts.
05.05 Paint or draw precise lettering for reproduction.
05.06 Utilize various types of prepared lettering processes.
05.07 Produce a sign on poster board.
05.08 Determine and select lettering styles for layout sketches.
05.09 Illuminate a certificate.

06.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

06.01 Explain proper use, care and cleaning of equipment.
06.02 Identify and select typography materials.
06.03 Define typographic terms, including leading and kerning.
06.04 Identify and select typographic methods.
06.05 Demonstrate the ability to proofread and use proofreaders' marks.
06.06 Explain picas, points and conversion to inches.
06.07 Explain specification of type and copy fitting.
06.08 Identify and select typographic styles.
06.09 Define basic letter structures.
06.10 Demonstrate mixing of families of type.

07.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--the Student will be able to:

07.01 Explain proper use and care of tools.
07.02 Identify parts of a layout.
07.03 Utilize amberlith, rubylith, screens, overlays and register marks.
07.04 Make thumbnail sketch pencil layouts.
07.05 Prepare comprehensives from pencil layouts.
07.06 Prepare camera-ready mechanicals from comprehensives.
07.07 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
07.08 Crop and scale artwork andor photos for layouts.
07.09 Demonstrate enlarging or reducing with a grid, proportion wheel and other methods.
07.10 Make a color separation with overlays.
07.11 Demonstrate various ruling techniques.
07.12 Demonstrate the uses of different adhesives.
07.13 Specify the use of halftones or special effects.
07.14 Explain layout and color trends.

08.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

08.01 Explain proper use and care of tools.
08.02 Demonstrate elementary anatomy drawing skills.
08.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor and paints.
08.04 Demonstrate renderings of different textures using the above media.
08.05 Make illustrations using various subjects.
08.06 Make a montage illustration.
08.07 Draw a cartoon.

09.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

09.01 Locate and identify resource materials and develop a morgue.
09.02 Design logos.
09.03 Design stationery layouts.
09.04 Design a magazine/book cover or record jacket.
09.05 Design an ad campaign that includes newspapers, magazines and billboards.
09.06 Design a greeting card.
09.07 Design a business card.
09.08 Apply advertising psychology.
09.09 Produce an industrial brochure.
09.10 Design a consumer brochure.
09.11 Construct a package design.
09.12 Produce TV story boards.
09.13 Develop a square and half-drop repeat design.
09.14 Produce computer-assisted artwork. (optional)

10.0 DEMONSTRATE PROFICIENCY IN PHOTOSTAT CAMERA SKILLS--The student will be able to:

10.01 Explain proper use and care of equipment, chemicals and supplies.
10.02 Identify parts of a camera.
10.03 Define photography terms.
10.04 Make negative and positive line shots on paper and film.
10.05 Make halftones.
10.06 Demonstrate enlarging and reducing.
10.07 Demonstrate stripping.
10.08 Demonstrate opaquing.

11.0 DEMONSTRATE PROFICIENCY IN AIRBRUSH SKILLS--The student will be able to:

11.01 Explain proper use and care of tools.
11.02 Identify airbrush parts.
11.03 Perform airbrush exercises: dots, lines and graded shadings.
11.04 Select appropriate surfaces and painting materials.
11.05 Define the use of masking materials.
11.06 Airbrush a painting using masks or brushes.
11.07 Airbrush geometric shapes.
11.08 Airbrush freehand painting.
11.09 Airbrush an illustration of a product.
11.10 Retouch photos.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly

used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify and adopt acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Business Machine Maintenance

CODE NUMBER: Secondary ______ Postsecondary I470102

Florida CIP 0647.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___7-9 ____9-12 _x_Postsecondary Adult Vocational

______ Postsecondary Vocational _x_ Other 30,31

CERTIFICATION COVERAGE: BUS MACH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as office machine servicers (85926651), (633.281-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the maintenance and repair of a variety of office machines as typewriters, dictation machines, calculators, data processing equipment, duplicating machines, and mailing machines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in diagnostic/troubleshooting technique, use of test equipment, and applied mechanics, and electrical/electronic theory as they relate to the repair of business machines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor circuits.
08. Demonstrate proficiency in technical recording and reporting.
09. Troubleshoot, maintain, and repair electronic typewriters.
10. Troubleshoot, maintain, and repair electromechanical typewriters.
11. Troubleshoot, maintain, and repair electronic printing calculators.
12. Troubleshoot, maintain, and repair selenium drum process (SDP) copy equipment.
13. Troubleshoot, maintain, and repair cadmium sulfide (CDS) copy equipment.
14. Troubleshoot, maintain, and repair word processing equipment.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Business Machine Maintenance POSTSECONDARY NUMBER: I470102

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply ohm's law and power formula.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using VOM and DVM meters and oscilloscopes.
02.09 Compute and measure conductance and resistance of conductors and insulators.
02.10 Apply ohm's law to series circuits.
02.11 Construct and verify operation and series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel/parallel-series circuits.
02.17 Construct and verify the operation of series-parallel/parallel-series and bridge circuits.
02.18 Troubleshoot series-parallel/parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties and circuits and devices.
02.25 Determine and physical and electrical characteristics of capacitors and inductors.
02.26 Define RC and RL time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).

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03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter, and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of RLC circuits (series, parallel, and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel, and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot RC, RL, and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor/inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of pn junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors (FET's).
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for sold-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.

04.18 Set up and operate capacitor/inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze/minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.

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06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define, and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory-device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic/data analyzers for troubleshooting microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment-failure reports.
08.06 Specify and requisition simply electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

09.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTRONIC TYPEWRITERS--The student will be able to:

09.01 Read and interpret schematic and block diagrams of electronic typewriters.
09.02 Determine the defective status of keyboards.
09.03 Troubleshoot keyboards.
09.04 Remove and replace keyboards or components.
09.05 Perform operating systems check and make minor adjustments to keyboards.
09.06 Perform preventive maintenance.
09.07 Determine the defective status of logic boards.
09.08 Troubleshoot logic boards.
09.09 Remove and replace logic boards or components.
09.10 Perform operating systems check and make minor adjustments to logic boards.
09.11 Perform preventive maintenance on logic boards.
09.12 Determine the defective status of printing carriers.
09.13 Troubleshoot printing carriers.
09.14 Remove and replace printing carriers or components.
09.15 Perform operating systems check and make minor adjustments to printing carriers.
09.16 Perform preventive maintenance on printing carriers.
09.17 Determine the defective status of power supplies.
09.18 Troubleshoot power supplies.
09.19 Remove and replace power supplies or components.
09.20 Perform operating systems check and make minor adjustments to power supplies.
09.21 Perform preventive maintenance on power supplies.

10.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

10.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
10.02 Determine the defective status of escapement mechanisms.
10.03 Troubleshoot escapement mechanisms.
10.04 Remove and replace escapement mechanisms or components.
10.05 Perform operating systems check and make minor adjustments to escapement mechanisms.
10.06 Perform preventive maintenance on escapement mechanisms.
10.07 Determine the defective status of keyboards.
10.08 Troubleshoot keyboards.
10.09 Remove and replace keyboards or components.
10.10 Perform operating systems check and make minor adjustments to keyboards.
10.11 Perform preventive maintenance on keyboards.
10.12 Determine the defective status of printing carriers.
10.13 Troubleshoot printing carriers.
10.14 Remove and replace printing carriers or components.
10.15 Perform operating systems check and make minor adjustments to printing carriers.
10.16 Perform preventive maintenance on printing carriers.
10.17 Determine the defective status of cycle clutch drives including motor.
10.18 Troubleshoot cycle clutch drives including motor.
10.19 Remove and replace cycle clutch drives including motor or components.
10.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
10.21 Perform preventive maintenance on cycle clutch drives including motor.
10.22 Determine the defective status of OP-CAM shafts.
10.23 Troubleshoot OP-CAM shafts.
10.24 Remove and replace OP-CAM shafts or components.

10.25 Perform operating systems check and make minor adjustments to OP-CAM shafts.
10.26 Perform preventive maintenance on OP-CAM shafts.

11.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTRONIC PRINTING CALCULATORS--The student will be able to:

11.01 Read and interpret schematic and block diagrams on electronic printing calculators.
11.02 Determine the defective status of power supplies.
11.03 Troubleshoot power supplies.
11.04 Remove and replace power supplies or components.
11.05 Perform operating systems check and make minor adjustments to power supplies.
11.06 Perform preventive maintenance on power supplies.
11.07 Determine defective status of printing carriers.
11.08 Troubleshoot printing carriers.
11.09 Remove and replace printing carriers or components.
11.10 Perform operating systems check and make minor adjustments to printing carriers.
11.11 Perform preventive maintenance on printing carriers.
11.12 Determine defective status of logic boards.
11.13 Troubleshoot logic boards.
11.14 Remove and replace logic boards or components.
11.15 Perform operating systems check and make minor adjustments to logic boards.
11.16 Perform preventive maintenance on logic boards.
11.17 Determine defective status of keyboards.
11.18 Troubleshoot keyboards.
11.19 Remove and replace keyboards or components.
11.20 Perform operating systems check and make minor adjustments to keyboards.
11.21 Perform preventive maintenance on keyboards.

12.0 TROUBLESHOOT, MAINTAIN AND REPAIR SELENIUM DRUM PROCESS (SDP) COPY EQUIPMENT--The student will be able to:

12.01 Read and interpret schematic and block diagrams on SDP copy equipment.
12.02 Determine the defective status of power supplies.
12.03 Troubleshoot power supplies.
12.04 Remove and replace power supplies or components.
12.05 Perform operating systems check and make minor adjustments to power supplies.
12.06 Perform preventive maintenance on power supplies.
12.07 Determine the defective status of logic boards.
12.08 Troubleshoot logic boards.
12.09 Remove and replace logic boards or components.
12.10 Perform operating systems check and make minor adjustments to logic boards.
12.11 Perform preventive maintenance on logic boards.
12.12 Determine the defective status of optic systems.
12.13 Troubleshoot optic systems.
12.14 Remove and replace optic systems or components.
12.15 Perform operating systems check and make minor adjustments to optic systems.
12.16 Perform preventive maintenance on optic systems.
12.17 Determine the defective status of fusing systems.
12.18 Troubleshoot fusing systems.
12.19 Remove and replace fusing systems or components.
12.20 Perform operating systems check and make minor adjustments to fusing system.

12.21 Perform preventive maintenance on fusing systems.

13.0 TROUBLESHOOT, MAINTAIN AND REPAIR CADMIUM SULFIDE (CDS) COPY EQUIPMENT--The student will be able to:

13.01 Read and interpret schematic and block diagrams on CDS process copy equipment.
13.02 Determine the defective status of power supplies.
13.03 Troubleshoot power supplies.
13.04 Remove and replace power supplies or components.
13.05 Perform operating systems check and make minor adjustments to power supplies.
13.06 Perform preventive maintenance on power supplies.
13.07 Determine the defective status of logic boards.
13.08 Troubleshoot logic boards.
13.09 Remove and replace logic boards and components.
13.10 Perform operating systems check and make minor adjustments to logic boards.
13.11 Perform preventive maintenance on logic boards.
13.12 Determine the defective status of optic systems.
13.13 Troubleshoot optic systems.
13.14 Remove and replace optic systems or components.
13.15 Perform operating systems check and make minor adjustments to optic systems.
13.16 Perform preventive maintenance on optic systems.
13.17 Determine the defective status of fusing systems.
13.18 Troubleshoot fusing systems.
13.19 Remove and replace fusing systems or components.
13.20 Perform operating systems check and make minor adjustments to fusing systems.
13.21 Perform preventive maintenance on fusing systems.

14.0 TROUBLESHOOT, MAINTAIN AND REPAIR WORD PROCESSING EQUIPMENT--The student will be able to:

14.01 Read and interpret schematic and block diagrams of microcomputers (word processing equipment).
14.02 Determine the defective status of systems software.
14.03 Troubleshoot system software.
14.04 Remove and replace system software or components.
14.05 Perform operating systems check and make minor adjustments to system software.
14.06 Perform preventive maintenance on systems software.
14.07 Determine the defective status of power supplies.
14.08 Troubleshoot power supplies.
14.09 Remove and replace power supplies or components.
14.10 Perform operating systems check and make minor adjustments to power supplies.
14.11 Perform preventive maintenance on power supplies.
14.12 Determine the defective status of daisy wheel printing.
14.13 Troubleshoot daisy wheel printers.
14.14 Remove and replace daisy wheel printers or components.
14.15 Perform operating systems check and make minor adjustments to daisy wheel printers.
14.16 Perform preventive maintenance on daisy wheel printers.
14.17 Determine the defective status of dot matrix printers.
14.18 Troubleshoot dot matrix printers.
14.19 Remove and replace dot matrix printers and components.
14.20 Perform operating systems check and make minor adjustments to dot matrix printers.
14.21 Perform preventive maintenance on dot matrix printers.
14.22 Determine the defective status of logic boards.

14.23 Troubleshoot logic boards.
14.24 Remove and replace logic boards or components.
14.25 Perform operating systems check and make minor adjustments to logic boards or components.
14.26 Perform preventive maintenance on logic boards.
14.27 Determine the defective status of keyboards.
14.28 Troubleshoot keyboards.
14.29 Remove and replace keyboards or components.
14.30 Perform operating systems check and make minor adjustments to keyboards.
14.31 Perform preventive maintenance on keyboards.
14.32 Determine the defective status of display/CRT terminals.
14.33 Troubleshoot display/CRT terminals.
14.34 Remove and replace display/CRT terminals or components.
14.35 Perform operating systems check and make minor adjustments to display/CRT terminals.
14.36 Perform preventive maintenance on display/CRT terminals.
14.37 Determine the defective status of disc drives.
14.38 Troubleshoot disc drives.
14.39 Remove and replace disc drives or components.
14.40 Perform operating systems check and make minor adjustments to disc drives.
14.41 Perform preventive maintenance on disc drives.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Fishing

CODE NUMBER: Secondary 8751200 Postsecondary I490303

Florida CIP 0649.030300

SECONDARY SCHOOL CREDITS 5 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMM FISH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as fishing vessel captains (77002508), (197.133-018), net fishers (411.684-010), line fishers (442.684-010), fisher, net (gillnet) (441.684-010), shrimp boat deckhands (449.667-010), deckhands (911.687-022), net repairers (499.664-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The plan of instruction prepares individuals for crew duties on seagoing boats, barges and ships. Included are boat operation, fishing operations, cleaning and preservation, loading and unloading and emergency procedures.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, crew duties on seagoing boats, trailers, and small ships. Included is vessel operation and maintenance, vessel navigation, vessel handling, shrimp and net fishing, pot and line fishing, and galley operation/food preparation.

Listed below are the courses that comprise this program when offered at the secondary level:

8751210	Commercial Fishing 1
8751220	Commercial Fishing 2
8751230	Commercial Fishing 3
8751240	Commercial Fishing 4
8751250	Commercial Fishing 5

II. LABORATORY ACTIVITIES: Laboratory and onboard activities are an integral part of this program and provide instruction in the safe and efficient operation of commercial watercraft and related systems. Emphasis is placed on vessel operations and fishing techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this vocational program: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 750 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Unlock and get a vessel underway.
02. Dock a vessel.
03. Operate a vessel at sea.
04. Maneuver around offshore structures.
05. Anchor vessel.
06. Manage and perform cargo handling duties.
07. Perform shrimp boat deckhand duties.
08. Perform net fisher duties.
09. Perform pot fisher duties.
10. Perform line fisher duties.
11. Bring vessel into port.
12. Perform crew operational and maintenance duties aboard a vessel in port.
13. Prepare meals aboard vessel.
14. Plan and perform emergency procedures.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Commercial Fishing

EFFECTIVE DATE: July, 1993
SECONDARY NUMBER: 8751200
POSTSECONDARY NUMBER: I490303

01.0 UNLOCK AND GET VESSEL UNDERWAY--The student will be able to:

01.01 Bleed air compressor of water.
01.02 Check and maintain batteries.
01.03 Measure fuel in day tank.
01.04 Maintain proper level of coolant in expansion tank.
01.05 Determine if all navigation lights are functioning.
01.06 Tighten engine mounts.
01.07 Inspect water level indicators for cleanliness.
01.08 Test marine radio equipment.
01.09 Inspect antenna for physical damage.
01.10 Determine if hydraulic steering equipment is free of air and water.
01.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
01.12 Inspect buoyant apparatus for excessive wear, proper location and prescribed type.
01.13 Determine that rudder stuffing box is functioning properly.
01.14 Tighten propeller stuffing box.
01.15 Inspect vessel for fuel leakage.
01.16 Prepare list of equipment to be checked for oil leakage.
01.17 Determine if proper voltage is being generated.
01.18 Maneuver vessel from birth into navigable waterway.
01.19 Pump out bilges.
01.20 Secure loose deck equipment.
01.21 Secure watertight doors, hatches, vents and skylights.

02.0 DOCK A VESSEL--The student will be able to:

02.01 Assign crew members positions for mooring vessel.
02.02 Cast off vessel's mooring lines while remaining on dock.
02.03 Cast off vessel's mooring lines while remaining aboard vessel.
02.04 Tie various knots used in maritime operations.
02.05 Maneuver vessel to dock.
02.06 Release towing gear aboard towing vessel and barges.
02.07 Secure mooring lines to dock.
02.08 Secure mooring lines to vessel.
02.09 Secure engine room.
02.10 Secure propeller shaft.
02.11 Inspect engine room equipment for proper maintenance and safety.
02.12 Correct nautical chart prior to departure.
02.13 Prepare vessel to take on fuel and lube oil.
02.14 Prepare to take on water aboard vessel.
02.15 Splice eye into line.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil and fuel filters on engines.
03.06 Change oil in engines.
03.07 Demonstrate knowledge of the rules of the road in operating a vessel.

03.08 Determine time of arrival when current effect is known.
03.09 Determine time of arrival when current effect is unknown.
03.10 Display day or night signals for different towing situations.
03.11 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.12 Clean engine room and its equipment.
03.13 Determine Greenwich Mean Time (GMT) by using vessel's chronometer.
03.14 Determine position by using Omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Operate radar equipment.
03.17 Interpret basic meteorological data.
03.18 Determine "distance off" by using angular measurements.
03.19 Establish a vessel's dead reckoning (DR) track.
03.20 Determine position by means of celestial navigation.
03.21 Plot position by using Loran and Loran overprint charts.
03.22 Set sea watches.
03.23 Chip and paint vessel.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, housers, or mooring lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tides and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.
06.06 Load cargo by suing bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

07.0 PERFORM SHRIMP BOAT DECKHAND DUTIES--The student will be able to:

07.01 Stand lookout, steering, and engine room watches.
07.02 Attach nets, slings, hooks, and other lifting devices to cables, booms, and hoists.
07.03 Load equipment and supplies aboard vessel by hand or using hoisting equipment.
07.04 Signal other workers to move, hoist, and position loads.
07.05 Row boats and dinghies and operate skiffs to transport fishers, and to tow and position nets.
07.06 Attach accessories, such as floats, weights, and markers to nets and lines.
07.07 Pull and guide nets and lines onto vessel.
07.08 Remove shrimp from nets.
07.09 Sort and clean marine life and return undesirable and illegal catch to the sea.
07.10 Operate brine tank and refrigeration equipment.

07.11 Place catch in containers and store in hold and cover with salt and ice.
07.12 Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water.
07.13 Lubricate, adjust, and make minor repairs to engines and equipment.

08.0 PERFORM NET FISHER DUTIES--The student will be able to:

08.01 Catch finfish, shellfish, and other marine life alone or as crew.
08.02 Use and operate equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets.
08.03 Use and operate equipment such as purse seine, haul, drag, or beach seine.
08.04 Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set tow and anchor net.
08.05 Attach flags and lights to buoys to identify net location.
08.06 Put net into water and anchor or tow net according to kind of net used, location of fishing area, and method of fishing.
08.07 Haul net to boat or shore manually and using winch.
08.08 Empty catch from net, using dip net, brail bucket, hydraulic pump, and conveyor, and by lifting net, using block and tackle, and dumping catch.
08.09 Store catch in hold and containers, or transfer catch to base ship or bigger boat.
08.10 Ride in skiff and hold end of net as base ship discharges net to surround school of fish or other seafood.
08.11 Sort and clean fish.
08.12 Repair fishing nets and gear.
08.13 Act as lookout or observe instruments to sight schools of fish.

09.0 PERFORM POT FISHER DUTIES--The student will be able to:

09.01 Fish for marine life, including crab, eel, or lobster, using pots (cages with funnel-shaped net openings).
09.02 Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water.
09.03 Hook marker float with pole and pull up pot.
09.04 Reach through hinged door of pot to remove catch or dump catch on deck.
09.05 Measure catch with fixed gauge to insure compliance with legal size.
09.06 Place legal catch in container and toss illegal catch overboard.
09.07 Place peg in hinge of claws to prevent lobsters in container from killing each other.
09.08 Rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle.

10.0 PERFORM LINE FISHER DUTIES--The student will be able to:

10.01 Catch fish and other marine life with hooks and lines, working alone or as a member of crew.
10.02 Lay out line and attach hooks, bait, sinkers, and various anchors, floats, and swivels, depending on quarry sought.
10.03 Put line into water, and hold, anchor, or troll (tow) line to catch fish.
10.04 Haul line onto boat deck by hand, reel, or sinch, and remove catch.
10.05 Store catch in hold or boxes and pack catch in ice.
10.06 Hit fish with club to stun it before removing it from hook.

10.07 Use gaff to assist in hauling fish from water.
10.08 Slit fish, remove viscera, and wash cavity to clean fish for storage.
10.09 Steer vessel in fishing area.

11.0 BRING VESSEL INTO PORT--The student will be able to:

11.01 Determine approximate position and hazardous conditions by using fathometer.
11.02 Determine position by using radio direction finder (RDF).
11.03 Determine vessel's course and position against dead reckoning plots.

12.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

12.01 Arrange for dry docking a vessel.
12.02 Change brushes in auxiliary engines.
12.03 Change lube oil filters on auxiliary engines.
12.04 Change fuel filters on auxiliary engines.
12.05 Clean electric motor.
12.06 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
12.07 Determine if const-a-voltage regulator is functioning properly.
12.08 Determine if drive bolts on air compressors are excessively loose.
12.09 Tighten panel box fittings to prevent vibration.
12.10 Clean keel cool strainers.
12.11 Clean oil coolers.
12.12 Clean oil strainers in marine gears.
12.13 Drain water out of fuel traps.
12.14 Tighten fuel and oil line connections on engines.
12.15 Inspect day tanks containing fuel for leaks.
12.16 Lubricate deck and engine room equipment on a regular schedule.
12.17 Determine vessel's manning requirements.
12.18 Wash down vessel's superstructure and decks.

13.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

13.01 Make yeast breads.
13.02 Make pie crust.
13.03 Make cream filling in pie.
13.04 Make pancakes.
13.05 Make corn bread.
13.06 Make cakes.
13.07 Make biscuits.
13.08 Clean galley deck, woodwork, and cabinets.
13.09 Wash dishes, glasses, flatware, trays, pots and pans.
13.10 Cook vegetables by boiling, simmering and steaming.
13.11 Cook meats, seafood, and fowl by frying.
13.12 Cook meats, seafood, and fowl by stewing and braising.
13.13 Cook meats, seafood, and fowl by broiling.
13.14 Cook meats, seafood, and fowl by roasting or baking.
13.15 Cook meats, seafood, and fowl by braising.
13.16 Season and bread meats, seafoods, and fowl for baking, roasting, broiling and frying.
13.17 Cook eggs by frying and scrambling.
13.18 Make gravies.
13.19 Make coffee.
13.20 Make salads.
13.21 Prepare soup stock.
13.22 Prepare sandwiches.
13.23 Prepare dehydrated or concentrated foods.

13.24 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
13.25 Carve cooled meats.
13.26 Cut, trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
13.27 Clean and care for equipment.
13.28 Order food.
13.29 Plan menu.
13.30 Keep records for purchasing foods.
13.31 Store food.
13.32 Keep continuous inventory of food items.

14.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

14.01 Act as lookout to keep person in sight who has been lost overboard.
14.02 Administer first aid to prevent shock.
14.03 Administer first aid to control bleeding.
14.04 Administer CPR.
14.05 Launch lifeboat and life raft.
14.06 Close emergency fuel shutoff valves.
14.07 Extinguish class A, B, and C type fires.
14.08 Maneuver life raft or lifeboat away from vessel.
14.09 Maneuver vessel to return to area in which person was lost overboard.
14.10 Issue life preservers for use by passengers and crew.
14.11 Secure engine room to prevent spread of fire.
14.12 Send out distress signals.
14.13 Sound abandon-ship alarm.
14.14 Train crew to perform emergency procedures.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
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16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes,

chemical reaction, and moisture content.

17.02 Draw conclusions or make inferences from data.

17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.

18.02 Secure information about a job.

18.03 Identify documents which may be required when applying for a job interview.

18.04 Complete a job application form correctly.

18.05 Demonstrate competence in job interview techniques.

18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.

18.07 Identify acceptable work habits.

18.08 Demonstrate knowledge of how to make appropriate job changes.

18.09 Demonstrate acceptable employee health habits.

18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.

19.02 Describe the importance of entrepreneurship to the American economy.

19.03 List the advantages and disadvantages of business ownership.

19.04 Identify the risks involved in ownership of a business.

19.05 Identify the necessary personal characteristics of a successful entrepreneur.

19.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing

PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 1

COURSE NUMBER: 8751210

This course provides instruction in docking, starting, and operating a vessel at sea.

01.0 UNLOCK AND GET VESSEL UNDERWAY--The student will be able to:

01.01 Bleed air compressor of water.
01.02 Check and maintain batteries.
01.03 Measure fuel in day tank.
01.04 Maintain proper level of coolant in expansion tank.
01.05 Determine if all navigation lights are functioning.
01.06 Tighten engine mounts.
01.07 Inspect water level indicators for cleanliness.
01.08 Test marine radio equipment.
01.09 Inspect antenna for physical damage.
01.10 Determine if hydraulic steering equipment is free of air and water.
01.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
01.12 Inspect buoyant apparatus for excessive wear, proper location and prescribed type.
01.13 Determine that rudder stuffing box is functioning properly.
01.14 Tighten propeller stuffing box.
01.15 Inspect vessel for fuel leakage.
01.16 Prepare list of equipment to be checked for oil leakage.
01.17 Determine if proper voltage is being generated.
01.18 Maneuver vessel from birth into navigable waterway.
01.19 Pump out bilges.
01.20 Secure loose deck equipment.
01.21 Secure watertight doors, hatches, vents and skylights.

02.0 DOCK A VESSEL--The student will be able to:

02.01 Assign crew members positions for mooring vessel.
02.02 Cast off vessel's mooring lines while remaining on dock.
02.03 Cast off vessel's mooring lines while remaining aboard vessel.
02.04 Tie various knots used in maritime operations.
02.05 Maneuver vessel to dock.
02.06 Release towing gear aboard towing vessel and barges.
02.07 Secure mooring lines to dock.
02.08 Secure mooring lines to vessel.
02.09 Secure engine room.
02.10 Secure propeller shaft.
02.11 Inspect engine room equipment for proper maintenance and safety.
02.12 Correct nautical chart prior to departure.
02.13 Prepare vessel to take on fuel and lube oil.
02.14 Prepare to take on water aboard vessel.
02.15 Splice eye into line.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.

03.05 Change oil and fuel filters on engines.
03.06 Change oil in engines.
03.07 Demonstrate knowledge of the rules of the road in operating a vessel.
03.08 Determine time of arrival when current effect is known.
03.09 Determine time of arrival when current effect is unknown.
03.10 Display day or night signals for different towing situations.
03.11 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.12 Clean engine room and its equipment.
03.13 Determine Greenwich Mean Time (GMT) by using vessel's chronometer.
03.14 Determine position by using Omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Operate radar equipment.
03.17 Interpret basic meteorological data.
03.18 Determine "distance off" by using angular measurements.
03.19 Establish a vessel's dead reckoning (DR) track.
03.20 Determine position by means of celestial navigation.
03.21 Plot position by using Loran and Loran overprint charts.
03.22 Set sea watches.
03.23 Chip and paint vessel.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing — PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 2 — COURSE NUMBER: 8751220

COURSE DESCRIPTION:

This course includes instruction in maneuvering, anchoring and handling cargo.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, housers, or mooring lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tides and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.
06.06 Load cargo by suing bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 3 COURSE NUMBER: 8751230

COURSE DESCRIPTION:

This course includes instruction in shrimping, net fishing, pot fishing, and line fishing.

07.0 PERFORM SHRIMP BOAT DECKHAND DUTIES--The student will be able to:

07.01 Stand lookout, steering, and engine room watches.
07.02 Attach nets, slings, hooks, and other lifting devices to cables, booms, and hoists.
07.03 Load equipment and supplies aboard vessel by hand or using hoisting equipment.
07.04 Signal other workers to move, hoist, and position loads.
07.05 Row boats and dinghies and operate skiffs to transport fishers, and to tow and position nets.
07.06 Attach accessories, such as floats, weights, and markers to nets and lines.
07.07 Pull and guide nets and lines onto vessel.
07.08 Remove shrimp from nets.
07.09 Sort and clean marine life and return undesirable and illegal catch to the sea.
07.10 Operate brine tank and refrigeration equipment.
07.11 Place catch in containers and store in hold and cover with salt and ice.
07.12 Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water.
07.13 Lubricate, adjust, and make minor repairs to engines and equipment.

08.0 PERFORM NET FISHER DUTIES--The student will be able to:

08.01 Catch finfish, shellfish, and other marine life alone or as crew.
08.02 Use and operate equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets.
08.03 Use and operate equipment such as purse seine, haul, drag, or beach seine.
08.04 Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set tow and anchor net.
08.05 Attach flags and lights to buoys to identify net location.
08.06 Put net into water and anchor or tow net according to kind of net used, location of fishing area, and method of fishing.
08.07 Haul net to boat or shore manually and using winch.
08.08 Empty catch from net, using dip net, brail bucket, hydraulic pump, and conveyor, and by lifting net, using block and tackle, and dumping catch.
08.09 Store catch in hold and containers, or transfer catch to base ship or bigger boat.
08.10 Ride in skiff and hold end of net as base ship discharges net to surround school of fish or other seafood.
08.11 Sort and clean fish.
08.12 Repair fishing nets and gear.

08.13 Act as lookout or observe instruments to sight schools of fish.

09.0 PERFORM POT FISHER DUTIES--The student will be able to:

09.01 Fish for marine life, including crab, eel, or lobster, using pots (cages with funnel-shaped net openings).
09.02 Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water.
09.03 Hook marker float with pole and pull up pot.
09.04 Reach through hinged door of pot to remove catch or dump catch on deck.
09.05 Measure catch with fixed gauge to insure compliance with legal size.
09.06 Place legal catch in container and toss illegal catch overboard.
09.07 Place peg in hinge of claws to prevent lobsters in container from killing each other.
09.08 Rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle.

10.0 PERFORM LINE FISHER DUTIES--The student will be able to:

10.01 Catch fish and other marine life with hooks and lines, working alone or as a member of crew.
10.02 Lay out line and attach hooks, bait, sinkers, and various anchors, floats, and swivels, depending on quarry sought.
10.03 Put line into water, and hold, anchor, or troll (tow) line to catch fish.
10.04 Haul line onto boat deck by hand, reel, or sinch, and remove catch.
10.05 Store catch in hold or boxes and pack catch in ice.
10.06 Hit fish with club to stun it before removing it from hook.
10.07 Use gaff to assist in hauling fish from water.
10.08 Slit fish, remove viscera, and wash cavity to clean fish for storage.
10.09 Steer vessel in fishing area.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing — PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 4 — COURSE NUMBER: 8751240

COURSE DESCRIPTION:

This course includes instruction in bringing a vessel into port and performing maintenance duties.

11.0 BRING VESSEL INTO PORT--The student will be able to:

11.01 Determine approximate position and hazardous conditions by using fathometer.
11.02 Determine position by using radio direction finder (RDF).
11.03 Determine vessel's course and position against dead reckoning plots.

12.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

12.01 Arrange for dry docking a vessel.
12.02 Change brushes in auxiliary engines.
12.03 Change lube oil filters on auxiliary engines.
12.04 Change fuel filters on auxiliary engines.
12.05 Clean electric motor.
12.06 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
12.07 Determine if const-a-voltage regulator is functioning properly.
12.08 Determine if drive bolts on air compressors are excessively loose.
12.09 Tighten panel box fittings to prevent vibration.
12.10 Clean keel cool strainers.
12.11 Clean oil coolers.
12.12 Clean oil strainers in marine gears.
12.13 Drain water out of fuel traps.
12.14 Tighten fuel and oil line connections on engines.
12.15 Inspect day tanks containing fuel for leaks.
12.16 Lubricate deck and engine room equipment on a regular schedule.
12.17 Determine vessel's manning requirements.
12.18 Wash down vessel's superstructure and decks.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Commercial Fishing	PROGRAM NUMBER: 8751200
COURSE TITLE: Commercial Fishing 5	COURSE NUMBER: 8751250

COURSE DESCRIPTION:

This course includes instruction in meals preparation, emergency procedures, and employability skills.

13.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

13.01 Make yeast breads.
13.02 Make pie crust.
13.03 Make cream filling in pie.
13.04 Make pancakes.
13.05 Make corn bread.
13.06 Make cakes.
13.07 Make biscuits.
13.08 Clean galley deck, woodwork, and cabinets.
13.09 Wash dishes, glasses, flatware, trays, pots and pans.
13.10 Cook vegetables by boiling, simmering and steaming.
13.11 Cook meats, seafood, and fowl by frying.
13.12 Cook meats, seafood, and fowl by stewing and braising.
13.13 Cook meats, seafood, and fowl by broiling.
13.14 Cook meats, seafood, and fowl by roasting or baking.
13.15 Cook meats, seafood, and fowl by braising.
13.16 Season and bread meats, seafoods, and fowl for baking, roasting, broiling and frying.
13.17 Cook eggs by frying and scrambling.
13.18 Make gravies.
13.19 Make coffee.
13.20 Make salads.
13.21 Prepare soup stock.
13.22 Prepare sandwiches.
13.23 Prepare dehydrated or concentrated foods.
13.24 Make soup with stock, meats, vegetables, and seasonings, as

required by recipe.
13.25 Carve cooled meats.
13.26 Cut, trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
13.27 Clean and care for equipment.
13.28 Order food.
13.29 Plan menu.
13.30 Keep records for purchasing foods.
13.31 Store food.
13.32 Keep continuous inventory of food items.

14.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

14.01 Act as lookout to keep person in sight who has been lost overboard.
14.02 Administer first aid to prevent shock.
14.03 Administer first aid to control bleeding.
14.04 Administer CPR
14.05 Launch lifeboat and life raft.
14.06 Close emergency fuel shutoff valves.
14.07 Extinguish class A, B, and C type fires.
14.08 Maneuver life raft or lifeboat away from vessel.
14.09 Maneuver vessel to return to area in which person was lost overboard.
14.10 Issue life preservers for use by passengers and crew.
14.11 Secure engine room to prevent spread of fire.
14.12 Send out distress signals.
14.13 Sound abandon-ship alarm.
14.14 Train crew to perform emergency procedures.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
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18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Foods

CODE NUMBER: Secondary 8763000 Postsecondary ______

Florida CIP 0620.041300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: COMM COOK @ 7 G QUAN FOOD @ 7 G
VOC HME EC @ 4 HOME EC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as food preparation workers (65038416) and cooks (313.361-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: food preparation and serving; and identification, storage selection and presentation of a wide variety of foods.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8763010	Commercial Foods 1
8763020	Commercial Foods 2
8763030	Commercial Foods 3
8763040	Commercial Foods 4
8763050	Commercial Foods 5
8763060	Commercial Foods 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's Individual Education Plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate acceptable professional and personal sanitation practices.
02. Demonstrate safe working practices.
03. Demonstrate equipment operation skills.
04. Demonstrate effective cost control.
05. Prepare and manage salads.
06. Prepare and manage beverages.
07. Prepare and manage sandwiches.
08. Prepare and manage fruits and vegetables.
09. Prepare and manage meats, poultry, and seafood.
10. Prepare and manage stocks, soups, and sauces/gravies.
11. Prepare and manage foods utilizing dairy products.
12. Prepare and manage foods utilizing egg products.
13. Prepare and manage foods utilizing farinaceous (starchy) products.
14. Prepare and manage basic desserts.
15. Prepare and manage basic quick breads and yeast dough.
16. Prepare and manage specialty items.
17. Demonstrate proficiency in dining room operations.
18. Demonstrate a proficiency in customer relations.
19. Demonstrate appropriate communication skills.
20. Demonstrate appropriate math skills.
21. Demonstrate appropriate understanding of basic science.
22. Demonstrate employability skills.
23. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8763000
PROGRAM TITLE: Commercial Foods POSTSECONDARY NUMBER: ___

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

- 01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
- 01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
- 01.01.03 Identify and practice personnel handling precautions for caustics and acids.
- 01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

- 01.02.01 Identify food borne illness and possible/probable causes.
- 01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

- 01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

- 01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
- 01.04.02 Clean and sanitize floors and walls.
- 01.04.03 Recognize and report indications of food spoilage.
- 01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

- 01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
- 01.05.02 Clean and sanitize floors and walls.
- 01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

- 01.06.01 Degrease and clean range hoods.
- 01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.
02.01.09 Recognize and correct or report fire safety hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient

manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.
03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.
03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.08.03 Operate mixers and blenders in a safe and efficient manner.
03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be sued when working with slicing machines.
03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)
03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.
03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.
04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.
04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.
04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)
04.03.02 Identify and apply portion control methods.

05.0 PREPARE AND MANAGE SALADS.--The student will be able to:

05.01 Identify and select materials for salad preparation.
05.02 Prepare salads.
05.03 Hold salads for service.
05.04 Garnish and present salads.
05.05 Store reusable portions.
05.06 Prepare salad dressings, cold sauces, and derivatives.

06.0 PREPARE AND MANAGE BEVERAGES.--The student will be able to:

06.01 Identify and select materials for beverage preparation.
06.02 Prepare hot and cold beverages.
06.03 Hold beverages for serving.
06.04 Garnish and present beverages.
06.05 Store reusable portions.

07.0 PREPARE AND MANAGE SANDWICHES.--The student will be able to:

07.01 Identify and select materials for sandwich preparation.
07.02 Prepare hot and cold sandwiches.
07.03 Hold sandwiches for serving.
07.04 Garnish and present sandwiches.
07.05 Store reusable portions.

08.0 PREPARE AND MANAGE FRUITS AND VEGETABLES.--The student will be able to:

08.01 Identify and select fruits and vegetables.
08.02 Prepare fruits and vegetables.
08.03 Hold fruits and vegetables for serving.
08.04 Garnish and present fruits and vegetables.
08.05 Store reusable portions.

09.0 PREPARE AND MANAGE MEATS, POULTRY AND SEAFOOD.--The student will be able to:

09.01 Identify and select meats.

09.01.01 Identify meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.01.02 Prepare meats with given recipes.
09.01.03 Hold meats for serving.
09.01.04 Garnish and present meats.
09.01.05 Store reusable portions.

09.02 Identify and select poultry.

- 09.02.01 Identify poultry characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
- 09.02.02 Prepare poultry with given recipes.
- 09.02.03 Hold poultry for serving.
- 09.02.04 Garnish and present poultry.
- 09.02.05 Store reusable portions.

09.03 Identify and select seafood.

- 09.03.01 Identify seafood characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
- 09.03.02 Prepare seafood with given recipes.
- 09.03.03 Hold seafood for serving.
- 09.03.04 Garnish and present seafood.
- 09.03.05 Store reusable portions.

10.0 PREPARE AND MANAGE STOCKS, SOUPS, AND SAUCES/GRAVIES.--The student will be able to:

10.01 Stocks

- 10.01.01 Identify and select ingredients.
- 10.01.02 Prepare basic stocks.
- 10.01.03 Store stock for future use.

10.02 Soups

- 10.02.01 Identify and select ingredients.
- 10.02.02 Prepare soups.
- 10.02.03 Hold soups for service.
- 10.02.04 Garnish and present soups
- 10.02.05 Store leftover portions for future use.

10.03 Sauces and Gravies

- 10.03.01 Identify and select ingredients.
- 10.03.02 Prepare sauces and gravies.
- 10.03.03 Hold sauces and gravies for service.
- 10.03.04 Store left over sauces and gravies for future use.

11.0 PREPARE AND MANAGE FOODS UTILIZING DAIRY PRODUCTS.--The student will be able to:

11.01 Identify and select dairy products.
11.02 Prepare foods utilizing dairy products using given recipes.
11.03 Hold food containing dairy products for service.
11.04 Garnish and present foods containing dairy products.
11.05 Store reusable portions.

12.0 PREPARE AND MANAGE FOODS UTILIZING EGG PRODUCTS.--The student will be able to:

12.01 Identify and select egg products.
12.02 Prepare foods utilizing egg products using given recipes.
12.03 Hold food containing egg products for service.

12.04 Garnish and present foods containing egg products.
12.05 Store reusable portions.

13.0 PREPARE AND MANAGE FOODS UTILIZING FARINACEOUS (STARCHY) PRODUCTS.--The student will be able to:

13.01 Identify and select farinaceous products.
13.02 Prepare foods utilizing farinaceous products using given recipes.
13.03 Hold food containing farinaceous products for service.
13.04 Garnish and present foods containing farinaceous products.
13.05 Store reusable portions.

14.0 PREPARE AND MANAGE BASIC DESSERTS.--The student will be able to:

14.01 Identify and select dessert ingredients.
14.02 Prepare basic dessert products.
14.03 Hold dessert products for service.
14.04 Garnish and present dessert products.
14.05 Store reusable portions.

15.0 PREPARE AND MANAGE BASIC QUICK BREADS AND YEAST DOUGH.--The student will be able to:

15.01 Quick Breads

15.01.01 Identify and select quick bread ingredients.
15.01.02 Prepare quick breads using given recipes.
15.01.03 Hold quick breads for service.
15.01.04 Present quick breads.
15.01.05 Store reusable portions.

15.02 Yeast doughs

15.02.01 Identify and select yeast dough ingredients.
15.02.02 Prepare yeast dough products using given recipes.
15.02.03 Hold yeast dough products for service.
15.02.04 Present yeast dough products.
15.02.05 Store reusable portions.

16.0 PREPARE AND MANAGE SPECIALTY ITEMS.--The student will be able to:

16.01 Hot and Cold Appetizers

16.01.01 Identify and select ingredients.
16.01.02 Prepare hot and cold appetizers using given recipes.
16.01.03 Hold hot and cold appetizers for service.
16.01.04 Garnish and present hot and cold appetizers.
16.01.05 Store reusable portions.

16.02 Aspic Coated Appetizers

16.02.01 Identify and select ingredients.
16.02.02 Prepare aspic coated appetizers using given recipes.
16.02.03 Hold aspic coated appetizers for service.
16.02.04 Garnish and present aspic coated appetizers.
16.02.05 Store reusable portions.

16.03 Petite Salads

16.03.01 Identify and select ingredients.
16.03.02 Prepare petite salads using given recipes.
16.03.03 Hold petite salads for service.
16.03.04 Garnish and present petite salads.
16.03.05 Store reusable portions.

16.04 Specialty Soups and Consumes'

16.04.01 Identify and select ingredients.
16.04.02 Prepare specialty soups.
16.04.03 Hold specialty soups for service.
16.04.04 Garnish and present specialty soups.
16.04.05 Store left over portions for future use.

16.05 Cocktails

16.05.01 Identify and select ingredients.
16.05.02 Prepare cocktails using given recipes.
16.05.03 Hold cocktails for service.
16.05.04 Garnish and present cocktails.
16.05.05 Store reusable portions.

16.06 Dips

16.06.01 Identify and select ingredients.
16.06.02 Prepare dips using given recipes.
16.06.03 Hold dips for service.
16.06.04 Garnish and present dips.
16.06.05 Store reusable portions.

16.07 Variety Meats

16.07.01 Identify variety meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
16.07.02 Prepare variety meats with given recipes.
16.07.03 Hold variety meats for serving.
16.07.04 Garnish and present variety meats.
16.07.05 Store reusable portions.

16.08 Meringues

16.08.01 Identify and select ingredients.
16.08.02 Prepare meringues using given recipes.
16.08.03 Hold meringues for service.
16.08.04 Garnish and present meringues.
16.08.05 Store reusable portions.

16.09 Sugar Cookies

16.09.01 Identify and select ingredients.
16.09.02 Prepare sugar cookies using given recipes.
16.09.03 Hold sugar cookies for service.
16.09.04 Garnish and present sugar cookies.
16.09.05 Store reusable portions.

16.10 Cake Decorating

16.10.01 Identify and select ingredients for cake decorating.
16.10.02 Select and prepare decorating equipment.

16.10.03 Prepare icings from given recipes.
16.10.04 Decorate cakes and pastries.
16.10.05 Hold cakes and pastries for service.
16.10.06 Present cakes and pastries.
16.10.07 Store reusable portions.
16.10.08 Apply cake decorating practices to garnishes and presentations.

17.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

17.01 Prepare and maintain dining room for service.
17.02 Greet and escort customers.
17.03 Customer Service.

17.03.01 Present menu/menus
17.03.02 Sell and merchandise menu items.
17.03.03 Take orders.
17.03.04 Serve food.
17.03.05 Calculate and present guest check.

17.04 Handling money.

17.04.01 Demonstrate responsible cash handling.
17.04.02 Demonstrate ability to calculate and county customers change.

18.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS.--The student will be able to:

18.01 Resolve customer complaints in a positive professional manner.
18.02 Cope with stressful situations.
18.03 Accommodate the needs of customers (handicapped, infants, elderly.)
18.04 Maintain a positive friendly dining room attitude.
18.05 Display team work.
18.06 Present a neat and clean appearance that will promote a positive image of the establishment.

19.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

19.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
19.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
19.03 Read and follow written and oral instructions.
19.04 Answer and ask questions coherently and concisely.
19.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
19.06 Demonstrate appropriate telephone/communication skills.

20.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

20.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
20.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
20.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
20.04 Determine the correct purchase price, to include sales tax for a

materials list containing a minimum of six items.

20.05 Demonstrate an understanding of federal, state and local taxes and their computation.

21.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

21.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
21.02 Draw conclusions or make inferences from data.
21.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
21.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

22.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

22.01 Conduct a job search.
22.02 Secure information about a job.
22.03 Identify documents which may be required when applying for a job.
22.04 Complete a job application form correctly.
22.05 Demonstrate competence in job interview techniques.
22.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
22.07 Identify acceptable work habits.
22.08 Demonstrate a knowledge of how to make appropriate job changes.
22.09 Demonstrate acceptable employee health habits.
22.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

23.01 Define entrepreneurship.
23.02 Describe the importance of entrepreneurship to the American economy.
23.03 List the advantages and disadvantages of business ownership.
23.04 Identify the risks involved in ownership of a business.
23.05 Identify the necessary personal characteristics of a successful entrepreneur.
23.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods

PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 1

COURSE NUMBER: 8763010

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
01.01.03 Identify and practice personnel handling precautions for caustics and acids.
01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

01.02.01 Identify food borne illness and possible/probable causes.
01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
01.04.02 Clean and sanitize floors and walls.
01.04.03 Recognize and report indications of food spoilage.
01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
01.05.02 Clean and sanitize floors and walls.
01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

01.06.01 Degrease and clean range hoods.
01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.
02.01.09 Recognize and correct or report fire safety

hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment.

Inspect all parts and report any discrepancy.

03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.

03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.

03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.

03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.08.03 Operate mixers and blenders in a safe and efficient manner.

03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be sued when working with slicing machines.

03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)

03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.

03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.

04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.

04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.

04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)
04.03.02 Identify and apply portion control methods.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 2 COURSE NUMBER: 8763020

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

05.0 PREPARE AND MANAGE SALADS.--The student will be able to:

05.01 Identify and select materials for salad preparation.
05.02 Prepare salads.
05.03 Hold salads for service.
05.04 Garnish and present salads.
05.05 Store reusable portions.
05.06 Prepare salad dressings, cold sauces, and derivatives.

06.0 PREPARE AND MANAGE BEVERAGES.--The student will be able to:

06.01 Identify and select materials for beverage preparation.
06.02 Prepare hot and cold beverages.
06.03 Hold beverages for serving.
06.04 Garnish and present beverages.
06.05 Store reusable portions.

07.0 PREPARE AND MANAGE SANDWICHES.--The student will be able to:

07.01 Identify and select materials for sandwich preparation.
07.02 Prepare hot and cold sandwiches.

07.03 Hold sandwiches for serving.
07.04 Garnish and present sandwiches.
07.05 Store reusable portions.

08.0 PREPARE AND MANAGE FRUITS AND VEGETABLES.--The student will be able to:

08.01 Identify and select fruits and vegetables.
08.02 Prepare fruits and vegetables.
08.03 Hold fruits and vegetables for serving.
08.04 Garnish and present fruits and vegetables.
08.05 Store reusable portions.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods — PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 3

COURSE NUMBER: 8763030

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

09.0 PREPARE AND MANAGE MEATS, POULTRY AND SEAFOOD--The student will be able to:

09.01 Identify and select meats.

09.01.01 Identify meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.01.02 Prepare meats with given recipes.
09.01.03 Hold meats for serving.
09.01.04 Garnish and present meats.
09.01.05 Store reusable portions.

09.02 Identify and select poultry.

09.02.01 Identify poultry characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.02.02 Prepare poultry with given recipes.
09.02.03 Hold poultry for serving.
09.02.04 Garnish and present poultry.
09.02.05 Store reusable portions.

09.03 Identify and select seafood.

09.03.01 Identify seafood characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and

potential micro-organism growth.
09.03.02 Prepare seafood with given recipes.
09.03.03 Hold seafood for serving.
09.03.04 Garnish and present seafood.
09.03.05 Store reusable portions.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods
PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 4
COURSE NUMBER: 8763040

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

10.0 PREPARE AND MANAGE STOCKS, SOUPS, AND SAUCES/GRAVIES.--The student will be able to:

10.01 Stocks

10.01.01 Identify and select ingredients.
10.01.02 Prepare basic stocks.
10.01.03 Store stock for future use.

10.02 Soups

10.02.01 Identify and select ingredients.
10.02.02 Prepare soups.
10.02.03 Hold soups for service.
10.02.04 Garnish and present soups
10.02.05 Store leftover portions for future use.

10.03 Sauces and Gravies

10.03.01 Identify and select ingredients.
10.03.02 Prepare sauces and gravies.
10.03.03 Hold sauces and gravies for service.
10.03.04 Store left over sauces and gravies for future use.

11.0 PREPARE AND MANAGE FOODS UTILIZING DAIRY PRODUCTS.--The student will be able to:

11.01 Identify and select dairy products.
11.02 Prepare foods utilizing dairy products using given recipes.
11.03 Hold food containing dairy products for service.
11.04 Garnish and present foods containing dairy products.
11.05 Store reusable portions.

12.0 PREPARE AND MANAGE FOODS UTILIZING EGG PRODUCTS.--The student will be able to:

12.01 Identify and select egg products.
12.02 Prepare foods utilizing egg products using given recipes.
12.03 Hold food containing egg products for service.
12.04 Garnish and present foods containing egg products.
12.05 Store reusable portions.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods

PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 5

COURSE NUMBER: 8763050

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

13.0 PREPARE AND MANAGE FOODS UTILIZING FARINACEOUS (STARCHY) PRODUCTS.--The student will be able to:

13.01 Identify and select farinaceous products.
13.02 Prepare foods utilizing farinaceous products using given recipes.
13.03 Hold food containing farinaceous products for service.
13.04 Garnish and present foods containing farinaceous products.
13.05 Store reusable portions.

14.0 PREPARE AND MANAGE BASIC DESSERTS.--The student will be able to:

14.01 Identify and select dessert ingredients.
14.02 Prepare basic dessert products.
14.03 Hold dessert products for service.
14.04 Garnish and present dessert products.
14.05 Store reusable portions.

15.0 PREPARE AND MANAGE BASIC QUICK BREADS AND YEAST DOUGH.--The student will be able to:

15.01 Quick Breads

15.01.01 Identify and select quick bread ingredients.
15.01.02 Prepare quick breads using given recipes.
15.01.03 Hold quick breads for service.
15.01.04 Present quick breads.
15.01.05 Store reusable portions.

15.02 Yeast doughs

15.02.01 Identify and select yeast dough ingredients.
15.02.02 Prepare yeast dough products using given recipes.
15.02.03 Hold yeast dough products for service.
15.02.04 Present yeast dough products.

15.02.05 Store reusable portions.

16.0 PREPARE AND MANAGE SPECIALTY ITEMS.--The student will be able to:

16.01 Hot and Cold Appetizers

16.01.01 Identify and select ingredients.
16.01.02 Prepare hot and cold appetizers using given recipes.
16.01.03 Hold hot and cold appetizers for service.
16.01.04 Garnish and present hot and cold appetizers.
16.01.05 Store reusable portions.

16.02 Aspic Coated Appetizers

16.02.01 Identify and select ingredients.
16.02.02 Prepare aspic coated appetizers using given recipes.
16.02.03 Hold aspic coated appetizers for service.
16.02.04 Garnish and present aspic coated appetizers.
16.02.05 Store reusable portions.

16.03 Petite Salads

16.03.01 Identify and select ingredients.
16.03.02 Prepare petite salads using given recipes.
16.03.03 Hold petite salads for service.
16.03.04 Garnish and present petite salads.
16.03.05 Store reusable portions.

16.04 Specialty Soups and Consumes'

16.04.01 Identify and select ingredients.
16.04.02 Prepare specialty soups.
16.04.03 Hold specialty soups for service.
16.04.04 Garnish and present specialty soups.
16.04.05 Store left over portions for future use.

16.05 Cocktails

16.05.01 Identify and select ingredients.
16.05.02 Prepare cocktails using given recipes.
16.05.03 Hold cocktails for service.
16.05.04 Garnish and present cocktails.
16.05.05 Store reusable portions.

16.06 Dips

16.06.01 Identify and select ingredients.
16.06.02 Prepare dips using given recipes.
16.06.03 Hold dips for service.
16.06.04 Garnish and present dips.
16.06.05 Store reusable portions.

16.07 Variety Meats

16.07.01 Identify variety meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
16.07.02 Prepare variety meats with given recipes.
16.07.03 Hold variety meats for serving.
16.07.04 Garnish and present variety meats.
16.07.05 Store reusable portions.

16.08 Meringues

16.08.01 Identify and select ingredients.
16.08.02 Prepare meringues using given recipes.
16.08.03 Hold meringues for service.
16.08.04 Garnish and present meringues.
16.08.05 Store reusable portions.

16.09 Sugar Cookies

16.09.01 Identify and select ingredients.
16.09.02 Prepare sugar cookies using given recipes.
16.09.03 Hold sugar cookies for service.
16.09.04 Garnish and present sugar cookies.
16.09.05 Store reusable portions.

16.10 Cake Decorating

16.10.01 Identify and select ingredients for cake decorating.
16.10.02 Select and prepare decorating equipment.
16.10.03 Prepare icings from given recipes.
16.10.04 Decorate cakes and pastries.
16.10.05 Hold cakes and pastries for service.
16.10.06 Present cakes and pastries.
16.10.07 Store reusable portions.
16.10.08 Apply cake decorating practices to garnishes and presentations.

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PROGRAM TITLE: Commercial Foods PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 6 COURSE NUMBER: 8763060

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

17.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

17.01 Prepare and maintain dining room for service.
17.02 Greet and escort customers.
17.03 Customer Service.

17.03.01 Present menu/menus
17.03.02 Sell and merchandise menu items.
17.03.03 Take orders.
17.03.04 Serve food.
17.03.05 Calculate and present guest check.

17.04 Handling money.

17.04.01 Demonstrate responsible cash handling.
17.04.02 Demonstrate ability to calculate and count customers change.

18.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

18.01 Resolve customer complaints in a positive professional manner.
18.02 Cope with stressful situations.

18.03 Accommodate the needs of customers (handicapped, infants, elderly.)
18.04 Maintain a positive friendly dining room attitude.
18.05 Display team work.
18.06 Present a neat and clean appearance that will promote a positive image of the establishment.

19.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

19.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
19.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
19.03 Read and follow written and oral instructions.
19.04 Answer and ask questions coherently and concisely.
19.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
19.06 Demonstrate appropriate telephone/communication skills.

20.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

20.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
20.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
20.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
20.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
20.05 Demonstrate an understanding of federal, state and local taxes and their computation.

21.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

21.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
21.02 Draw conclusions or make inferences from data.
21.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
21.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

22.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

22.01 Conduct a job search.
22.02 Secure information about a job.
22.03 Identify documents which may be required when applying for a job.
22.04 Complete a job application form correctly.
22.05 Demonstrate competence in job interview techniques.
22.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
22.07 Identify acceptable work habits.
22.08 Demonstrate a knowledge of how to make job changes appropriately.
22.09 Demonstrate acceptable employee health habits.
22.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

23.01 Define entrepreneurship.
23.02 Describe the importance of entrepreneurship to the American economy.
23.03 List the advantages and disadvantages of business ownership.
23.04 Identify the risks involved in ownership of a business.
23.05 Identify the necessary personal characteristics of a successful entrepreneur.
23.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Foods and Culinary Arts

CODE NUMBER: Secondary ______ Postsecondary I200403

Florida CIP 0620.040300

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

____Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: QUAN FOOD @ 7 G COMM COOK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as restaurant cooks (65026412) and chefs/cooks (313.131-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: food preparation and serving; and identification, storage, selection and presentation of a wide variety of foods.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction is appropriate for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences as appropriate and a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate general housekeeping operations skills.
02. Demonstrate equipment operation skills.
03. Demonstrate stock, soup and sauce preparation skills.
04. Demonstrate fruit and vegetables preparation skills.
05. Demonstrate meat, poultry, fish and seafood preparation skills.
06. Demonstrate dairy, egg and farinaceous (starchy) product preparation skills.
07. Demonstrate salad, buffet food, beverage and related food preparation skills.
08. Demonstrate bakery goods and dessert preparation skills.
09. Demonstrate dining room operations skills.
10. Demonstrate a proficiency in customer relations.
11. Plan organize and implement work.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education   SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Foods and Culinary Arts   POSTSECONDARY NUMBER: I200403

01.0 DEMONSTRATE GENERAL HOUSEKEEPING OPERATIONS SKILLS--The student will be able to:

01.01 Receive goods.
01.02 Store goods.
01.03 Distribute goods.
01.04 Clean storage and receiving areas.
01.05 Clean refrigerators and freezers.
01.06 Inventory goods.
01.07 Prepare daily food order.
01.08 Prepare work area.
01.09 Clean work area.
01.10 Store pots and pans.
01.11 Prepare dishwashing area.
01.12 Prepare dishware for washing.
01.13 Wash dishware.
01.14 Clean dishwashing area.
01.15 Clean restrooms.
01.16 Clean floors.
01.17 Clean walls.
01.18 Clean filters.
01.19 Maintain clean and sanitary working area.
01.20 Read and follow equipment operating instructions.
01.21 Recognize and correct or report safety hazards.
01.22 Identify and select cleaning agents.

02.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS--The student will be able to:

02.01 Select and use hand tools.
02.02 Operate beverage equipment.
02.03 Set, control, load and unload ovens for roasting.
02.04 Use pressure cookers and steam equipment.
02.05 Disassemble, clean and reassemble kitchen equipment.
02.06 Operate microwave ovens.
02.07 Operate grinders and tenderizers.
02.08 Select, handle and sharpen knives and other cutting tools.
02.09 Operate ranges, griddles, fryers, broilers and toasters.
02.10 Operate proofers.
02.11 Operate mixers and blenders.
02.12 Operate slicing machines.
02.13 Set up and monitor food warmers.
02.14 Operate convection ovens.
02.15 Identify need and request tool and equipment repairs.
02.16 Operate power cutters, shredders and peelers.
02.17 Operate tilting quantity equipment.
02.18 Operate saws.

03.0 DEMONSTRATE STOCK, SOUP AND SAUCE PREPARATION SKILLS--The student will be able to:

03.01 Prepare basic white stocks.
03.02 Store and handle stocks, soups and sauces.
03.03 Prepare basic brown stocks.
03.04 Prepare fish stocks.

03.05 Prepare roux and other thickening agents.
03.06 Prepare self-thickening soups.
03.07 Prepare cream soups.
03.08 Prepare chowders.
03.09 Prepare tomato sauce and derivatives.
03.10 Recognize soups and sauces by taste and appearance.
03.11 Prepare soup and sauce garnishes.
03.12 Present stocks, soups and sauces for serving.
03.13 Reconstitute powdered soups and sauces.
03.14 Bind soups, sauces and stocks.
03.15 Prepare bechamel sauces and derivatives.
03.16 Prepare espagnole and demiglace sauces and derivatives.
03.17 Make jus and glace de viand.
03.18 Prepare veloutes and derivatives.
03.19 Prepare cold soups.
03.20 Prepare mustard, curry and other non-derivative sauces.
03.21 Prepare emulsions.
03.22 Clarify stocks.
03.23 Prepare clear soups.
03.24 Prepare bisque and other specialty soups.
03.25 Prepare hollandaise and derivatives.
03.26 Prepare mayonnaise and derivatives.

04.0 DEMONSTRATE FRUIT AND VEGETABLES PREPARATION SKILLS--The student will be able to:

04.01 Identify and select fruits and vegetables.
04.02 Clean and store fruit and vegetables.
04.03 Peel and core fruit.
04.04 Peel vegetables by hand or machine.
04.05 Cut fruit and vegetables.
04.06 Zest citrus fruit.
04.07 Score citrus fruit.
04.08 Prepare fruit and vegetable garnishes.
04.09 Section fruit.
04.10 Puree fruit or vegetables.
04.11 Simmer, stew or cream fruit and vegetables.
04.12 Broil fruit or vegetables.
04.13 Bake fruit and vegetables.
04.14 Braise fruit or vegetables.
04.15 Marinate and preserve fruit and vegetables.
04.16 Glaze fruit and vegetables.
04.17 Prepare processed fruits and vegetables.
04.18 Present fruit and vegetables for serving.
04.19 Bread and batter fruit or vegetables.
04.20 Blanche fruits or vegetables.
04.21 Stuff fruits or vegetables.
04.22 Deep fry fruits or vegetables.
04.23 Saute fruits or vegetables.
04.24 Turn vegetables.
04.25 Select, prepare, turn and cook mushrooms.
04.26 Identify, select and prepare nuts.

05.0 DEMONSTRATE MEAT, POULTRY, FISH AND SEAFOOD PREPARATION SKILLS--The student will be able to:

05.01 Identify and select meat and poultry.
05.02 Handle and store meat and poultry.
05.03 Stew meats and poultry.
05.04 Boil meats and poultry.
05.05 Prepare, grind and portion meats.
05.06 Select and determine doneness of meats.

05.07 Grill meats and poultry.
05.08 Broil meats and poultry.
05.09 Prepare garnishes for meat and poultry.
05.10 Portion meat and poultry.
05.11 Barbecue meats and poultry.
05.12 Deep fry meats and poultry.
05.13 Prepare stuffing/dressing.
05.14 Tenderize and marinate meats and poultry.
05.15 Trim and bone meats and poultry.
05.16 Present meats and poultry for serving.
05.17 Bread or batter fish and seafood for cooking.
05.18 Select and prepare processed fish and seafood.
05.19 Deep fry fish or seafood.
05.20 Boil or steam seafood.
05.21 Grill or broil fish and seafood.
05.22 Present fish and seafood for serving.
05.23 Poach meats and poultry.
05.24 Saute meats and poultry.
05.25 Identify types and cuts of meats.
05.26 Blanche meats and poultry.
05.27 Clean and tie poultry and meat.
05.28 Slice and carve meat and poultry.
05.29 Bake or roast meat and poultry.
05.30 Braise meats and poultry.
05.31 Stuff meats and poultry.
05.32 Prepare and cook forcemeat.
05.33 Lard, bard and piquer meats and poultry.
05.34 Prepare jellied meats.
05.35 Identify and select fish and seafoods.
05.36 Clean and wash fish.
05.37 Scale fish.
05.38 Peel and devein soft shellfish.
05.39 Store and handle fresh, frozen and cooked fish and seafood.
05.40 Split and crack lobster and other crustaceans.
05.41 Prepare whole fish for baking.
05.42 Prepare fish for stuffing.
05.43 Stew fish and seafood.
05.44 Saute fish and seafood.
05.45 Poach fish and seafood.
05.46 Braise fish and seafood.
05.47 Prepare snails (escargot).
05.48 Marinate fish and seafoods.
05.49 Open an shuck oysters, clams and mussels.
05.50 Prepare and cook frog legs.
05.51 Stuff fish or seafood.
05.52 Mount fish and seafood for cooking.
05.53 Prepare specialty fish and seafoods (turtle, eel, squid, octopus, etc.).

06.0 DEMONSTRATE DAIRY, EGG AND FARINACEOUS (STARCHY) PRODUCT PREPARATION SKILLS--The student will be able to:

06.01 Identify and select cheeses, milk, creams and butter.
06.02 Identify and select farinaceous foods and cereals.
06.03 Store and handle farinaceous foods and cereals.
06.04 Prepare breakfast cereals.
06.05 Store and handle fresh, frozen and cooked dairy products.
06.06 Store and handle eggs.
06.07 Boil eggs.
06.08 Fry eggs.
06.09 Scramble eggs.
06.10 Poach eggs.

06.11 Prepare omelets.
06.12 Reconstitute dairy or egg products.
06.13 Prepare egg batters.
06.14 Whip cream.
06.15 Select, break and separate eggs.
06.16 Prepare and cook pasta.
06.17 Select, prepare and cook rice for specific dishes.
06.18 Produce stuffed or combined pasta.
06.19 Prepare eggs for binding and coating.
06.20 Present dairy, eggs and farinaceous products for serving.
06.21 Shirr eggs.
06.22 Prepare cold or hot stuffed eggs.
06.23 Prepare hot and cold butters.
06.24 Prepare cream and cheese dressing,s spreads and fillings.
06.25 Prepare custards and cream fillings.
06.26 Prepare and cook crepes.
06.27 Prepare eggs for garnish and aspics.
06.28 Prepare dumplings.
06.29 Prepare souffles.

07.0 DEMONSTRATE SALAD, BUFFET FOOD, BEVERAGE AND RELATED FOOD PREPARATION SKILLS--The student will be able to:

07.01 Store and handle prepared cold food and beverages.
07.02 Reconstitute powdered beverages.
07.03 Prepare sandwich fillings.
07.04 Prepare greens for salads.
07.05 Prepare hot and cold beverages.
07.06 Select and extract juice from fruits and vegetables.
07.07 Prepare hot and cold sandwiches.
07.08 Prepare fruit salads and cocktails.
07.09 Prepare garnishes for salads and cold plats.
07.10 Prepare sliced meats for cold buffets.
07.11 Prepare vegetable salads.
07.12 Prepare farinaceous salads.
07.13 Prepare meat salads.
07.14 Prepare seafood or fish salads.
07.15 Set up and serve buffets.
07.16 Present salads, buffet foods and beverages for serving.
07.17 Prepare seafood cocktails.
07.18 Prepare salad dressings, cold sauces and derivatives.
07.19 Prepare cheese boards.
07.20 Prepare canapes and cold hors d'oeuvres.
07.21 Prepare hot hors d'oeuvres.
07.22 Prepare jellies and aspics.
07.23 Mount or mold meat and poultry.
07.24 Chemiser (coat), decorate, mold and serve buffets.
07.25 Prepare fondues.
07.26 Prepare mousses.
07.27 Prepare fat or ice sculptures.
07.28 Select, use and maintain buffet equipment and utensils.

08.0 DEMONSTRATE BAKERY GOODS AND DESSERT PREPARATION SKILLS--The student will be able to:

08.01 Identify and select baking and dessert ingredients.
08.02 Store and handle baking and dessert products.
08.03 Prepare gelatins and puddings using mixes.
08.04 Prepare baked products using mixes.
08.05 Prepare basic pie dough.
08.06 Make and bake pies.
08.07 Prepare and bake quick breads.

08.08 Prepare and cook pancakes, griddle cakes or waffles.
08.09 Prepare and bake yeast dough.
08.10 Prepare basic cake batters.
08.11 Prepare syrups, sweet sauces and gelatins.
08.12 Prepare and apply butter creams and icings.
08.13 Prepare and bake butter sponge cake.
08.14 Prepare fruit fillings for pie and pastries.
08.15 Present bakery goods and desserts for serving.
08.16 Prepare short paste products and cookies.
08.17 Prepare and cook donuts and other sweet yeast products.
08.18 Prepare and bake choux paste.
08.19 Produce basic pastry creams and Bavarian types.
08.20 Prepare and bake pate a baba.
08.21 Prepare and bake pate a brioche.
08.22 Decorate pastry cakes and desserts.
08.23 Prepare parfaits, bombes and coupes.
08.24 Prepare and bake puff pastry.
08.25 Prepare steam puddings.
08.26 Prepare chiffons.
08.27 Prepare and bake meringues.

09.0 DEMONSTRATE DINING ROOM OPERATIONS SKILLS--The student will be able to:

09.01 Handle guests with special needs children, handicapped and elderly.
09.02 Show customers to table.
09.03 Answer telephones.
09.04 Set tables.
09.05 Prepare beverages.
09.06 Provide counter or snack bar service.
09.07 Present dessert menu.
09.08 Wipe spills.
09.09 Prepare for special events.
09.10 Transport prepared foods.
09.11 Replenish server service station.
09.12 Load and carry bussing tray.
09.13 Clear and re-set dining room tables.
09.14 Return unused condiments.
09.15 Store and maintain equipment for special needs.
09.16 Serve customers.
09.17 Package food and beverages.
09.18 Maintain supplies in counter area.
09.19 Maintain and clean counter area.
09.20 Supervise serving staff.
09.21 Supervise appearance of dining room.
09.22 Greet customers.
09.23 Supervise guest comfort.
09.24 Take reservations.
09.25 Operate cash register.
09.26 Record sales breakdown.
09.27 Balance cash register.
09.28 Setup cafeteria line.
09.29 Display food and beverages.
09.30 Serve and replenish food items.
09.31 Close down cafeteria line.
09.32 Recruit and select employees.
09.33 Orient new employees.
09.34 Train employees.
09.35 Promote professionalism among employees.
09.36 Comply with local, state and federal regulations.
09.37 Calculate and schedule work hours for employees.
09.38 Handle customer complaints.

09.39 Perform bookkeeping duties.
09.40 Calculate ingredient costs selling price.
09.41 Develop and implement merchandising strategy.
09.42 Determine food and beverage requirements.
09.43 Purchase food and beverages.
09.44 Order supplies and equipment.
09.45 Bill customers.

10.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

10.01 Greet customer in a hospitable manner.
10.02 Handle customer complaints in a positive professional manner.
10.03 Handle stressful situations.
10.04 Meet the needs of handicapped and special needs of customers (handicapped, children, elderly).
10.05 Recognize and cater to the personal needs of each customer through a positive, friendly dining room attitude.
10.06 Distinguish the importance of team work in establishing a pleasant dining room atmosphere.
10.07 Present a neat and clean appearance that will promote the image of the establishment in the customer's opinion.
10.08 Express gratitude for customer's patronage and invite them to return.
10.09 Separate personal life from responsibility to work.
10.10 Identify attitudinal problems and discuss with management.
10.11 Sell and merchandise all menu items.
10.12 Project a positive attitude through words, smiles, body language, personality, etc.
10.13 React in all customer relations as though the "customer is always right."
10.14 Identify the advantages that will accrue through self-motivation such as advancement, increased salary and tips, better relations with customers, fellow employees and management.

11.0 PLAN, ORGANIZE AND IMPLEMENT WORK--The student will be able to:

11.01 Direct and monitor operation of meal assembly lines.
11.02 Rotate foods.
11.03 Conserve excess foods.
11.04 Prepare requisitions.
11.05 Write reports.
11.06 Communicate and coordinate work with related operations.
11.07 Take inventory.
11.08 Organize work station.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Photography

CODE NUMBER: Secondary _______ Postsecondary I480204

Florida CIP 0648.020400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: PHOTOG @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as photographers (34023188), commercial photographers (143.062-030) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the use of cameras and laboratory film-processing techniques in portrait, commercial and industrial applications with emphasis on composition and color dynamics, contact printing, enlarging and developing film, and use, care, and maintenance of photographic equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. Tools, equipment, materials and processes used in the photography programs should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).
04. Operate various format camera.
05. Finish photographs.
06. Apply lighting techniques.
07. Take studio photographs.
08. Reproduce photographic media.
09. Process color film.
10. Print color photographs.
11. Produce media presentations.
12. Manage a photographic business.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Photography POSTSECONDARY NUMBER: I480204

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.02 Hand-process black and white film.
01.03 Print black and white photographs.
01.04 Process black and white paper.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

02.01 Set appropriate f-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.
03.02 Compose photographs.
03.03 Take still photographs.
03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use 2¼ format camera.
04.02 Use view cameras.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

5.01 Mount photographs.
05.02 Mat/frame photographs.

06.0 APPLY LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.
08.02 Copy transparencies.
08.03 Make internegatives.

09.0 PROCESS COLOR FILM--The student will be able to:

09.01 Hand process color negatives and transparencies.
09.02 Process color negatives and transparencies.

10.0 PRINT COLOR PHOTOGRAPHS--The student will be able to:

10.01 Process color paper.
10.02 Print color negatives.
10.03 Print color negatives using color analyzer.

11.0 PRODUCE MEDIA PRESENTATIONS--The student will be able to:

11.01 Prepare script for slide presentation.
11.02 Shoot slides for slide presentation.
11.03 Produce slide presentation.
11.04 Prepare script for video presentation.
11.05 Shoot video tape.
11.06 Produce video presentation.

12.0 MANAGE THE PHOTOGRAPHIC BUSINESS--The student will be able to:

12.01 Apply communication skills.
12.02 Apply human relation skills.
12.03 Set rates for photographic work.

12.04 Maintain shop records and files.
12.05 Develop effective advertising.
12.06 Maintain presentational portfolio.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.

16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　　　　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　　　　　EFFECTIVE DATE: July 1993

PROGRAM TITLE: Commercial Refrigeration Technology

CODE NUMBER: Secondary　　Postsecondary I470321

Florida CIP 0647.023100

SECONDARY SCHOOL CREDITS _____　　COLLEGE CREDITS ____　　POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9　_____9-12　x Postsecondary Adult Vocational

x Postsecondary Vocational　　____ Other 30-31

CERTIFICATION COVERAGE: AC HEAT ME @ 7 G　　REFRG MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as commercial refrigeration installer-servicers (637.261-026), or to provide supplemental training for persons previously or currently employed in these occupations. Individuals completing this program will be qualified to work in the industry as commercial refrigeration technicians.

The course content includes, but is not limited to, planning installation, testing and servicing of commercial refrigeration systems and components; servicing, installation and troubleshooting electrical and mechanical components; testing, diagramming and solving problems in commercial refrigeration equipment; record keeping; supervisory skills; use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use of specialized tools and equipment, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocation programs is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: A training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a 'transfer value' assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The program may be offered in courses. vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The average length of this program for the typical student is 1800 hours when content form the Florida common core air conditioning refrigeration and heating program (Air Conditioning, Refrigeration and Heating Mechanics) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate a basic understanding of refrigeration.
02. Demonstrate proficiency in refrigeration cycle/diagrams.
03. Demonstrate a knowledge of refrigeration-servicing and testing equipment.
04. Demonstrate proficiency in refrigeration-piping materials and fabrication.
05. Demonstrate proficiency refrigeration pipe sizing and troubleshooting.
06. Demonstrate proficiency in basic electricity.
07. Demonstrate proficiency in electrical generation and distribution.
08. Demonstrate proficiency in electrical components/motors.
09. Demonstrate proficiency in solid state electronics.
10. Demonstrate proficiency in commercial and engineered control systems.
11. Demonstrate an understanding of refrigeration load.
12. Demonstrate proficiency in psychrometrics.
13. Demonstrate proficiency in metering devices.
14. Demonstrate proficiency in compressors.
15. Demonstrate proficiency in condensers.
16. Demonstrate proficiency in evaporators.
17. Demonstrate an understanding of accessories.
18. Demonstrate an understanding of commercial refrigeration-system application.
19. Demonstrate an understanding of refrigerated storage systems.
20. Diagnose and repair ice machines.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Refrigeration Technology
POSTSECONDARY NUMBER: I470321

01.0 DEMONSTRATE A BASIC UNDERSTANDING OF REFRIGERATION -- The student will be able to:

01.01 Demonstrate a basic understanding and appreciation of air conditioning and its impact on society.

02.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION CYCLE/DIAGRAMS -- The student will be able to:

02.01 Identify all zones and lines on the pressure enthalpy (PH) chart.
02.02 State the unit of measurement for H (Btu/lb).
02.03 Define enthalpy and entropy.
02.04 Diagram a simple cycle using the pressure enthalpy (PH) chart.
02.05 Show arrows for direction of cycle on the (PH) chart.
02.06 Calculate qe on the (PH) chart.
02.07 Calculate qw on the (PH) chart.
02.08 Calculate qc on the (PH) chart.

03.0 DEMONSTRATE A KNOWLEDGE OF REFRIGERATION-SERVICING AND TESTING EQUIPMENT -- The student will be able to:

03.01 Double and triple evacuate system with a two stage vacuum pump.
03.02 Properly use a micron gauge.
03.03 Properly use a mercury U-tube.

04.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION -PIPING MATERIALS AND FABRICATION -- The student will be able to:

04.01 Describe procedures used to protect valves/fittings from heat damage.
04.02 Describe the applications of vibration eliminators.
04.03 Identify and select correct insulation for application.

05.0 DETERMINE PROFICIENCY IN REFRIGERATION-PIPE SIZING AND TROUBLESHOOTING -- The student will be able to:

05.01 Determine capacities of refrigerant lines.
05.02 Determine equivalent lengths of fittings.
05.03 Calculate total effective length of pipe run.
05.04 Calculate amount of refrigerant in lines.
05.05 Describe use of traps in suction risers.
05.06 Explain pressure drop.
05.07 Explain saturation temperature drop.
05.08 Calculate pressure drop in liquid line risers.
05.09 Size double risers.
05.10 Size hot gas lines.
05.11 Size liquid line from condenser to receiver.

06.0 DEMONSTRATE PROFICIENCY IN BASIC ELECTRICITY -- The student will be able to:

06.01 Define and compare single and multi-phase voltage and current.
06.02 Use Ohm's law to calculate various circuit quantities.
06.03 Calculate electrical circuit loads.
06.04 Interpret tables and charts from National Electrical Code (NEC).

07.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL GENERATION AND DISTRIBUTION -- The student will be able to:

07.01 Demonstrate the ability to figure wire sizes and voltage drop.
07.02 Draw and identify power transformer types.
07.03 Size and test fuses and breakers and safely replace them.

08.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL COMPONENTS/MOTORS -- The student will be able to:

08.01 Define electromotive force, counter electromotive, torque and rotation.
08.02 Explain the operation and application of a three phase motor.
08.03 Explain the operation and application of shaded pole.
08.04 Explain the operation and application of permanent split capacitor.
08.05 Demonstrate proper use of testing equipment for motors.
08.06 Describe lubrication methods for motors.

09.0 DEMONSTRATE PROFICIENCY IN SOLID STATE ELECTRONICS -- The student will be able to:

09.01 Explain basic solid state circuits.
09.02 Identify, test, and replace circuit boards.

10.0 DEMONSTRATE PROFICIENCY IN COMMERCIAL AND ENGINEERED CONTROL SYSTEMS -- The student will be able to:

10.01 Identify electromechanical control systems.
10.02 Identify electronic control systems.
10.03 Identify programmable control systems.
10.04 Describe sequences of operation of types of control systems.

11.0 DEMONSTRATE AN UNDERSTANDING OF REFRIGERATION LOAD -- The student will be able to:

11.01 Define "U" value (BTu/hr. ft2-F).
11.02 Define "K" value (Fft2 hr./BTu).
11.03 Define "C" value (Fft2 hr./BTu).
11.04 Define "R" value (Fft2 hr./BTu).
11.05 Interpret heat transfer tables ("U, K, C, R").
11.06 Calculate total heat transfer value of any surface (R) - (U).
11.07 Explain conduction heat load source.
11.08 Explain infiltration as a heat load source.
11.09 Explain product heat load source.
11.10 Explain misc. loads (people, motors, equipment) as heat sources.
11.11 Explain the purpose of vapor barriers.
11.12 Interpret tables of specific heat values, intent heat and heat of respiration.

12.0 DEMONSTRATE PROFICIENCY IN PSYCHROMETRICS -- The student will be able to:

12.01 Identify the dry bulb line (DB).
12.02 Identify the wet bulb line (WB).
12.03 Identify relative humidity (RH).
12.04 Identify dew point (DP).
12.05 Identify enthalpy (h).
12.06 Identify specific humidity (grains of moisture) or (Lbw/Lbda).
12.07 Calculate refrigeration sensible heat ratio.

13.0 DEMONSTRATE PROFICIENCY IN METERING DEVICES -- The student will be able

to:

13.01 Define AEV.
13.02 Define low side float.
13.03 Define high side float.
13.04 Define hand expansion valve.
13.05 Evaluate system performance when using different types of flow control devices.

14.0 DEMONSTRATE PROFICIENCY IN COMPRESSORS -- The student will be able to:

14.01 Describe screw methods of compression.
14.02 Describe scroll methods of compression.
14.03 Select the correct compressor based on cooling load.
14.04 Describe the operation of reciprocating compressors.
14.05 Describe lubrication methods for compressors.
14.06 Describe the methods of compressor unloading.

15.0 DEMONSTRATE PROFICIENCY IN CONDENSORS -- The student will be able to:

15.01 Identify and describe evaporative condenser.
15.02 Determine proper air and water flow.
15.03 Adjust the air flow for proper temperature difference.
15.04 Adjust water flow for proper GPM and temperature difference.

16.0 DEMONSTRATE PROFICIENCY IN EVAPORATORS -- The student will be able to:

16.01 Identify and explain the operation of the different types of evaporator coils.

17.0 DEMONSTRATE AN UNDERSTANDING OF ACCESSORIES -- The student will be able to:

17.01 Identify the proper location of accumulators.
17.02 Identify the proper location of suction filters.
17.03 Identify the proper location of oil separators.
17.04 Identify the proper location of head pressure controls.
17.05 Identify the proper location of solenoid valves.
17.06 Identify the proper location of evaporator pressure regulating valve.
17.07 Identify the proper location of crankcase regulating valves.
17.08 Identify the proper location of heat exchangers.
17.09 Identify types and location of freeze protection.

18.0 DEMONSTRATE AN UNDERSTANDING OF COMMERCIAL REFRIGERATION-SYSTEM APPLICATION -- The student will be able to:

18.01 Explain the operation of a single compressor/evaporator system.
18.02 Explain the multiplex system.
18.03 Explain the cascade system.
18.04 Explain how to set superheat on a multiplex system.
18.05 Explain the heat reclaim cycle (three way value).
18.06 Explain the head pressure control system (flooded condenser).
18.07 Adjust EPR value.
18.08 Check the suction stop valve.
18.09 Check system for full refrigerant charge.
18.10 Charge system with refrigerant on liquid side as well as suction side.
18.11 Adjust all operating and safety controls.
18.12 Replace filter driers.
18.13 Check oil.
18.14 Change oil.

19.0 DEMONSTRATE AN UNDERSTANDING OF REFRIGERATED STORAGE SYSTEMS -- The student will be able to:

19.01 Explain the difference between medium temperature, low temperature, and ultra low temperature storage systems.
19.02 Identify service cases and self-service cases.
19.03 Explain the difference between service cases and self-service cases.
19.04 Explain the operation of air screen freezers.
19.05 Explain the operation of glass door freezers.
19.06 Explain the operation of coffin cases.
19.07 Explain the electrical resistance method of defrost.
19.08 Explain the hot gas method of defrost.
19.09 Explain the cool gas method of defrost.
19.10 Replace anti sweat heaters.
19.11 Replace fan motors and fans.
19.12 Check and/or replace fan delay.
19.13 Measure and verify air flow.
19.14 Clean drain line.

20.0 DIAGNOSE AND REPAIR ICE MACHINES -- The student will be able to:

20.01 Explain the operation of ice making.
20.02 Follow manufacturers' instructions for cleaning the evaporator.
20.03 Clean the condenser.
20.04 Check the harvest cycle.
20.05 Adjust cube size.
20.06 Check metering device for proper operation.
20.07 Check grid heaters when applicable.
20.08 Clean ice storage area.
20.09 Replace bearing in flake type machine.
20.10 Check water level.
20.11 Check water pressure.
20.12 Check for machine level.
20.13 Check water pump.
20.14 Check water spray.
20.15 Identify and explain the types of water treatment.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Sign Design and Fabrication

CODE NUMBER: Secondary ________ Postsecondary I480202

Florida CIP 0648.020200

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMM ART @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as sign makers (869.381-026), silkscreen makers (979.681-022), silkscreen operators (979.684-034), and silkscreen printers (979.684-030). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: basic art skills; lettering, sign painting, producing silkscreen prints; preparation of layouts and illustrations; computer-generated layout and design; architectural scale renderings; computer-cut letters and graphics; and development of specialized skills.

The course content should also include training in communication, leadership, human relations, employability skills, entrepreneurship principles, and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: lettering signs, layout and design, producing silkscreen prints, computer-generated letters and graphics, and fabricating signs.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S. the minimum basic skills grade level required for this postsecondary adult vocational program is: mathematics 9.0 and language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the approriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F. S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic trade skills.
02. Apply basic art skills.
03. Apply basic lettering skills.
04. Prepare layouts and illustrations.
05. Produce signs.
06. Prepare printing materials using silkscreen techniques.
07. Use computer signmaker.
08. Install signs.
09. Fabricate signs.
10. Wire signs.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE Commercial Sign Design and Fabrication POSTSECONDARY NUMBER: I480202

01.0 APPLY BASIC TRADE SKILLS--The student will be able to:

01.01 Apply safety skills.
01.02 Identify types of art materials.
01.03 Use and care of tools.
01.04 Maintain presentational portfolio.
01.05 Apply effective business practices including estimation of costs and defining differences in production processes.

02.0 APPLY BASIC ART SKILLS--The student will be able to:

02.01 Apply principles and elements of design including balance, symmetry, asymmetry, unity, harmony, line and shape, color and tone, contrast of proportion, texture, pattern and motion.
02.02 Render a color wheel.
02.03 Evaluate a drawing.
02.04 Analyze drawing to determine proportion.
02.05 Draw freehand sketches.
02.06 Draw using one-and two-point perspective.
02.07 Make corrections on a drawing.

03.0 APPLY BASIC LETTERING SKILLS--The student will be able to:

03.01 letter with speedball pen.
03.02 Letter blockstyle using a brush.
03.03 Letter Roman style using a brush.
03.04 Letter Roman italic style using a brush.
03.05 Letter script style using a brush.
03.06 Letter text style using a brush.
03.07 Letter quick style using a brush.
03.08 Letter Roman with serifs using a brush.
03.09 Letter using drop shading techniques.
03.10 Use striping techniques.

04.0 PREPARE LAYOUTS AND ILLUSTRATIONS--The student will be able to:

04.01 Layout thumbnails and roughs.
04.02 Layout color comprehensives.
04.03 Prepare finished illustrations.
04.04 Prepare architectural scale drawings.
04.05 Produce sign layouts.

05.0 PRODUCE SIGNS--The student will be able to:

05.01 Produce signs on posterboard.
05.02 Produce cloth and paper banners.
05.03 Produce signs on plywood and masonite.
05.04 Produce signs on metal.
05.05 Produce signs on glass.
05.06 Produce vehicular signs.
05.07 Produce sandblasted signs.
05.08 Produce engraved signs.
05.09 Produce routed signs.
05.10 Produce foam signs.
05.11 Produce signs using gold leaf techniques.

05.12 Produce signs on acrylic and polycarbonate.
05.13 Identify procedures for making neon signs.

06.0 PREPARE PRINTING MATERIAL USING SILKSCREEN TECHNIQUES--The student will be able to:

06.01 Produce silkscreen prints using cut stencil, one color.
06.02 Produce silkscreen prints using cut stencil, multicolor.
06.03 Produce silkscreen prints using photo stencil, one color.
06.04 Produce silkscreen prints using photo stencil, one color halftone.
06.05 Produce silkscreen prints using photo stencil, multicolor.

07.0 USE COMPUTER SIGN MAKER--The student will be able to:

07.01 Perform basic computer operations including layout, design and architectural scale rendering.
07.02 Clean and maintain computer.
07.03 Prepare computer drawn layout and pounce pattern.
07.04 Prepare computer cut vinyl signs.

08.0 INSTALL SIGNS--The student will be able to:

08.01 Describe anchors, fasteners and materials used in sign installation.
08.02 Describe interior sign installation techniques.
08.03 Describe exterior sign installation techniques.

09.0 FABRICATE SIGNS--The student will be able to:

09.01 Describe basic fabrication tools, materials and techniques.
09.02 Fabricate wood signs.
09.03 Fabricate plastic signs.
09.04 Fabricate metal signs.

10.0 WIRE SIGNS--The student will be able to:

10.01 Describe wiring tools and materials.
10.02 Identify electrical codes.
10.03 Wire neon signs.
10.04 Wire fluorescent signs.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and

whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job.
14.04 Complete a job-application form.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify and adopt acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15. DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Commercial Vehicle Driving

CODE NUMBER: Secondary _____   Postsecondary I490205

Florida CIP 0649.020500

SECONDARY SCHOOL CREDITS ___   COLLEGE CREDITS ___   POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___ Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: COMM DRIV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as tractor trailer\truck drivers (97105919), (904.383-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: operation of large semi truck tractor vehicles; loading and unloading cargo; reporting delays or accidents on the road; verifying load against shipping papers; and keeping records.

The course content should also include instruction in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Driving range activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: loading, backing and maneuvering on a practice field and public highways with other traffic.

III. SPECIAL NOTE: Students entering this program must exhibit a safe driving record, be at least 21 years of age and comply with State and Federal licensing requirements. Instruction will include 1000 miles of over-the-road driving under the supervision of a qualified commercial vehicle driver prior to completion of the program. Over-the-road driving activities will include experience on two-lane, four-lane, interstate, and city streets and highways. Twenty percent or more of the experience will occur at night on both wet and dry roads. Instruction in driving bob-tail, empty and loaded vehicles will be given.

If this program is 450 hours or longer, in accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0 and Language 7.0, Reading 8.0 This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination. To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 320 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Describe vehicle safety and accident prevention procedures.
02. Comply with vehicle operating regulations.
03. Demonstrate proper cargo handling and documentation procedures.
04. Demonstrate pre-trip preparation procedures.
05. Demonstrate vehicle inspection procedures.
06. Perform vehicle maintenance and servicing procedures.
07. Demonstrate basic vehicle control procedures.
08. Demonstrate backing, coupling and uncoupling skills.
09. Demonstrate basic vehicle maneuvers.
10. Demonstrate road driving skills.
11. Describe hazardous driving skills.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.
17. Obtain a Florida Commercial Vehicle Drivers License by passing written and performance tests.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education   SECONDARY NUMBER: _______

PROGRAM TITLE: Commercial Vehicle Driving   POSTSECONDARY NUMBER: 1490205

01.0 DESCRIBE VEHICLE SAFETY AND ACCIDENT PREVENTION PROCEDURES--The student will be able to:

01.01 Understand, identify and explain the use of vehicle safety equipment.
01.02 Explain the use of fire extinguishers and fire fighting procedures.
01.03 Utilize seat belts and personal protection gear appropriate to type of operation.
01.04 Describe safe lifting procedures.
01.05 Describe personal safety equipment and procedures.
01.06 Describe actions applicable for vehicle accidents.
01.07 Describe accident reporting requirements (company, state, federal).
01.08 Identify all information needed for accident reports to the State, the employer and the insurance company.
01.09 Complete an accident report.
01.10 Describe procedures for protecting the scene of an accident.
01.11 Identify types of hazardous cargos.
01.12 Describe personal liability requirements.
01.13 Identify hazardous road conditions that are a potential threat to the safety of the tractor trailer driver.
01.14 Describe activities and characteristics of other road users that make them potentially dangerous.
01.15 Describe the potential consequences of excessive speed.
01.16 Describe the potential consequences of use of drugs or alcohol.
01.17 Describe and demonstrate safety procedures for mounting and dismounting cab-over-engine tractors.

02.0 UNDERSTAND AND COMPLY WITH VEHICLE OPERATING REGULATIONS--The student will be able to:

02.01 Understand and comply with Hours of Service regulations.
02.02 Maintain a complete, neat and accurate driver's duty status log.
02.03 Keep accurate records required by hours of service regulations.
02.04 Perform mathematical calculations necessary to recap and apply totals to the hours of service regulations.
02.05 Determine driving hours remaining on a particular day or tour of duty.
02.06 Understand and comply with applicable United States Department of Transportation regulations.
02.07 Understand and comply with Florida Department of Transportation regulations.
02.08 Understand and comply with state and local traffic laws including restrictions on vehicle size and weight.
02.09 Identify permit requirements.

03.0 DEMONSTRATE PROPER CARGO HANDLING AND DOCUMENTATION PROCEDURES--The student will be able to:

03.01 Load and unload cargo safely and efficiently.
03.02 Obtain gross weight and axle weight.
03.03 Distribute cargo load to meet legal weight and safety requirements.
03.04 Secure cargo using blocking, bracing, packing, rope, cable, chains and strapping.

03.05 Mount placards when carrying hazardous materials.
03.06 Describe procedure for use of common cargo handling equipment, including pallets, jacks, dollies, handtrucks, forklift trucks, nets, slings, poles and other equipment.
03.07 Identify categories of hazardous materials and the need for specialized training to handle hazardous materials.
03.08 Identify hazardous materials documentation requirements.
03.09 Verify nature, amount and condition of cargo on both pickup and delivery.
03.10 Verify information on bill of lading and properly record and report discrepancies and damage to the cargo.
03.11 Obtain appropriate signatures on delivery receipts and other required forms.
03.12 Prepare a manifest.
03.13 Handle C.O.D. shipments.
03.14 Verify door seal number against shipping document.
03.15 Comply with port of entry or exit and other inspection station procedures.

04.0 DEMONSTRATE PRE-TRIP PREPARATION PROCEDURES-The student will be able to:

04.01 Check and secure tractor trailer or vehicle permit.
04.02 Check accident report packets for proper contents.
04.03 Plan a route from one point to another that is optimal in terms of travel time, fuel costs, potential hazards and federal, state and local travel restrictions.
04.04 Arrange to secure permits required by the nature of the vehicle, its cargo and route to be traveled.
04.05 Arrange a secure place for vehicle on layovers, especially when transporting hazardous materials.
04.06 Demonstrate map reading skills.
04.07 Estimate travel time and plan rest stops and layovers.
04.08 Estimate fuel consumption and plan fuel stops.
04.09 Estimate expense money and obtain funds and/or credit cards.

05.0 DEMONSTRATE VEHICLE INSPECTION PROCEDURES--The student will be able to:

05.01 Check general appearance and condition of vehicle.
05.02 Check fuel, oil, water levels and automatic transmission fluid level.
05.03 Check signal lights, stop lights and running lights.
05.04 Check tires, rims and suspension.
05.05 Check horn, windshield wipers, mirrors and reflectors.
05.06 Check fifth wheel, trailer hook-up and brake lines.
05.07 Check emergency flares and fire extinguishers.
05.08 Check instruments for normal readings.
05.09 Check steering system, brake action and tractor protection valve.
05.10 Check cargo blocking, bracing and tie down.
05.11 Perform enroute inspections of mirrors, instrument panel, engine and power train, suspension system and brakes.
05.12 Perform post-trip inspection of vehicle and all systems.

06.0 PERFORM VEHICLE MAINTENANCE AND SERVICING PROCEDURES--The student will be able to:

06.01 Describe function and operation of principle vehicle systems including, engine, engine auxiliary brake, drive train, coupling, suspension and electrical system.
06.02 Service engine fuel, oil, coolant, battery and filters.
06.03 Check tire air pressure.
06.04 Change wheels (with tires mounted) and check for proper tire and wheel mounting.

06.05 Drain moisture from air brake supply reservoirs and fuel.
06.06 Check and adjust brakes.
06.07 Clean and repair lights.
06.08 Change fuses and reset circuit breakers.
06.09 Clean interior and exterior of vehicle.
06.10 Check and replace mud/rain flaps.
06.11 Check and adjust tandem and fifth-wheel slides, if so equipped.

07.0 DEMONSTRATE BASIC VEHICLE CONTROL PROCEDURES--The student will:

07.01 Place transmission in neutral before starting engine.
07.02 Start, warm up and shut down the engine, according to the manufacturer's specifications.
07.03 Build full pressure (90-120 PSI) in air tanks before starting.
07.04 Test parking brake and service brake before starting.
07.05 Coordinate use of accelerator and clutch to achieve smooth acceleration and avoid clutch abuse.
07.06 Maintain proper engine RPM while driving.
07.07 Properly modulate air brakes to bring vehicle to a smooth stop.
07.08 Shift up and down through all gears of all major types of conventional transmissions.
07.09 Double clutch and time shift for smooth and fuel efficient performance.
07.10 Select proper gear for speed and highway conditions.
07.11 Operate automatic and semiautomatic transmissions.
07.12 Coordinate steering, braking and acceleration to take the vehicle through a desired path forward and backward in a straight line.
07.13 Adequately judge the path trailer will take (off-tracking) as vehicle negotiates left or right curves and turns.
07.14 Use clutch and gears to slow vehicle.
07.15 Park the vehicle, set brakes and shut off the engine.
07.16 Properly check/block wheels.

08.0 DEMONSTRATE BACKING, COUPLING AND UNCOUPLING SKILLS--The student will:

08.01 Check area before backing.
08.02 Properly utilize guides and mirrors.
08.03 Properly back in straight line and curved paths.
08.04 Properly back into an alley dock.
08.05 Properly parallel park.
08.06 Park in a jackknife position.
08.07 Judge side, rear and overhead clearances and path of the trailer.
08.08 Reverse-steer and articulate a vehicle.
08.09 Align the tractor properly to connect with trailer.
08.10 Back and secure the tractor properly into the trailer kingpin without damage.
08.11 Perform mechanical and visual checks to make sure coupling is secure.
08.12 Connect electrical and air lines properly.
08.13 Set in-cab air brake controls properly.
08.14 Retract and secure landing gear after coupling is secure.
08.15 Properly uncouple and secure the trailer, to include doubles.

09.0 DEMONSTRATE BASIC VEHICLE MANEUVERS--The student will be able to:

09.01 Make a straight-in approach to an alley.
09.02 Drive forward through an alley for 100 feet.
09.03 Properly stop the unit within 12 inches of the end of the alley.
09.04 Back 100 feet through an alley.
09.05 Properly stop the unit within 12 inches of the end of the alley.
09.06 Make proper straight in approach to multiple curves (serpentine).
09.07 Drive forward through curves (serpentine) while keeping tires

inside of line.

09.08 Properly position unit for backing into a loading dock.
09.09 Properly back to a dock.
09.10 Properly stop unit within 12 inches of the dock without contacting dock.
09.11 Properly enter a weighing platform.
09.12 Properly maneuver double bottom trailers.

10.0 DEMONSTRATE ROAD DRIVING SKILLS--The student will be able to:

10.01 Carefully enter traffic from parked position.
10.02 Use clutch and gears properly.
10.03 Proceed from a stopped position without rolling backward.
10.04 Use mirrors properly.
10.05 Signal intention to turn well in advance.
10.06 Get into proper lane well in advance of turn.
10.07 Check traffic conditions and turn only when intersection is clear.
10.08 Restrict traffic from passing on right when preparing to complete a right hand turn.
10.09 Complete a turn promptly and safely and not impede other traffic.
10.10 Select and shift to proper gear prior to beginning any turn.
10.11 Obey all traffic signals.
10.12 Plan stop in advance and adjust speed correctly.
10.13 Use brakes properly on grades.
10.14 Plan stop far enough in advance to avoid hard braking.
10.15 Stop clear of crosswalks.
10.16 Come to a complete stop at all stop signs.
10.17 Yield right of way at intersections having yield signs.
10.18 Check for cross traffic regardless of traffic signals.
10.19 Enter all intersections prepared to stop if necessary.
10.20 Stop a minimum of 15 feet but not more than 50 feet before railroad grade crossing if stop is necessary.
10.21 Select proper gear to avoid shifting gears on railroad grade crossing.
10.22 Determine sufficient space required for passing.
10.23 Pass only in safe locations.
10.24 Pass on two-lane highway.
10.25 Pass on four or more lane highway.
10.26 Signal lane changes before and after passing.
10.27 Warn driver ahead of intention to pass.
10.28 Pass only when appropriate to avoid impeding other traffic.
10.29 Return to right lane promptly, but only when safe to do so.
10.30 Observe speed limits.
10.31 Adjust speed properly to road, weather and traffic conditions.
10.32 Slow down in advance of curves, danger zones and intersections.
10.33 Maintain consistent speed where possible.
10.34 Yield right of way.
10.35 Allow faster traffic to pass.
10.36 Use horn only when necessary.
10.37 Park only in legally permissible parking areas.
10.38 Check instruments at regular intervals.
10.39 Maintain proper engine RPM while driving.
10.40 Demonstrate ability to properly maneuver double bottom trailers on two lane and four lane highways.
10.41 Determine minimum front-to-rear distances when following other vehicles.

11.0 DEMONSTRATE HAZARDOUS DRIVING SKILLS--The student will be able to:

11.01 Describe preparation for operation in cold weather, including activating the front brake limiting valve; removing snow and ice from windows, mirrors, brakes, lights, hand and toe holds, etc;

and installing tire chains when necessary.

11.02 Demonstrate proper procedure for expelling moisture from the air tanks after each trip.

11.03 Describe proper procedure for checking ice accumulation on brakes, slack adjuster, air hoses, electrical wiring and radiator shutters during operation.

11.04 Describe operational adjustments necessary to maintain control in all weather conditions, including speed selection, braking and following distance.

11.05 Describe procedures to check safe operation of brakes after driving through deep water.

11.06 Perform proper use of windshield wipers, washers and defrosters to maintain visibility.

11.07 Observe and evaluate changing road surface conditions.

11.08 Demonstrate ability for recognizing conditions that produce low traction, including initial rainfall, ice, snow and mud.

11.09 Describe procedures to avoid skidding and jackknifing.

11.10 Describe procedures to avoid hydroplaning and describe the road and vehicle conditions that produce it.

11.11 Describe procedures for mounting and dismounting tire chains.

11.12 Describe procedures for extricating the vehicle from snow, sand and mud by maneuvering or towing.

11.13 Demonstrate ability to adjust rate of change in speed and direction to accommodate road conditions to avoid skidding.

11.14 Describe procedures required to coordinate acceleration and shifting to overcome the resistance of snow, sand and mud.

11.15 Demonstrate ability to perform checks on brake adjustment prior to mountain driving.

11.16 Describe procedures required to use right lane or special truck lane going up grades.

11.17 Describe procedures required to place transmission in appropriate gear for engine braking before starting downgrade.

11.18 Describe procedures required to use proper braking techniques and maintain proper engine braking before starting downgrades.

11.19 Describe proper use of truck escape ramp when brakes fail on a downgrade.

11.20 Describe procedure required for observing temperature gauge frequently when pulling heavy loads up long grades.

11.21 Describe the effect of vehicle weight and speed upon braking and shifting ability on long downgrades.

11.22 Identify the meaning and use of percent of grade signs.

11.23 Demonstrate bringing the truck to a stop in the shortest possible distance while maintaining directional control on a dry surface.

11.24 Describe procedures to make an evasive turn off the roadway and return to the roadway while maintaining directional control.

11.25 Describe procedures to bring the vehicle to a stop in the event of a brake failure.

11.27 Describe procedures to maintain control of the vehicle in the event of a blowout.

11.28 Describe procedures to bring tractor trailer to a stop in the shortest possible distance while maintaining directional control when operating on a slippery surface.

11.29 Describe procedures to recover from tractor or trailer skids induced by snow, ice, water, oil, sand, wet leaves or other slippery surfaces.

11.30 Describe procedures to countersteer out of a skid in a way that will regain directional control and not produce another skid.

11.31 Describe procedure to operate brakes properly to provide maximum braking without loss of control.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify and adopt acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.

16.06 Identify the business skills needed to operate a small business efficiently and effectively.

17.0 OBTAIN A FLORIDA COMMERCIAL VEHICLE DRIVERS LICENSE BY PASSING WRITTEN AND PERFORMANCE TEST--The student will be able to:

17.01 Demonstrate competence in performing basic commercial vehicle driving skills.
17.02 Demonstrate understanding and knowledge of Florida Commercial Vehicle Driving Laws as required, to safely and legally operate a commercial vehicle.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Communication Electronics

CODE NUMBER: Secondary ______ Postsecondary 1470103

Florida CIP 0647.010300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: TEC ELEC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a communications technician, this program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: operation, maintenance and repair of AM and FM radios, single and double side band radios, data communication equipment, mobile radio/telephone systems, fiber optic systems, microwave equipment and satellite systems. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing communication equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated

basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800-2000 hours when content from the Florida common core electronics program (Electronics Technology) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in amplitude modulated radio transmitter and receiver systems.
02. Demonstrate proficiency in double side band and single side band radio systems.
03. Demonstrate proficiency in frequency modulated radio transmitter and receiver systems.
04. Demonstrate proficiency in high frequency AM and FM two-way radio systems.
05. Demonstrate proficiency in microwave systems.
06. Demonstrate proficiency in satellite systems.
07. Demonstrate proficiency in video systems.
08. Demonstrate proficiency in commercial audio systems.
09. Demonstrate proficiency in data communications.
10. Demonstrate proficiency in fiber optic communications systems.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Communication Electronics POSTSECONDARY NUMBER: I470103

01.0 DEMONSTRATE PROFICIENCY IN AMPLITUDE MODULATED RADIO TRANSMITTER AND RECEIVER SYSTEMS--The student will be able to:

01.01 Describe the operation of amplitude modulated (AM) radio systems.
01.02 Identify the stages of AM radio transmitters and receivers.
01.03 Define principles of AM modulation.
01.04 Analyze and troubleshoot AM transmitter and receiver circuits to include mixers, IF amplifiers, local oscillators, modulators, demodulators and microphones.
01.05 Align intermediate frequency (IF) circuits using the AM signal generator or sweep generator and oscilloscope.
01.06 Measure the IF section bandwidth using a sweep generator and an oscilloscope or signal generator and a spectrum analyzer.
01.07 Measure input voltage sensitivity to the receiver using a signal to noise ratio meter or spectrum analyzer.
01.08 Determine signal to noise ratio.
01.09 Conduct operating systems checks of AM transmitter and receiver circuits and make minor adjustments.
01.10 Set up and adjust AM antenna systems using a power meter and standing wave ratio (SWR) meter.
01.11 Analyze AM radio circuits using spectrum analyzers, noise analyzers impedance bridges, sweep generators, dummy loads and phase meters.
01.12 Measure AM radio signals using power meters, field strength meters and distortion meters.
01.13 Analyze, troubleshoot and adjust AM heterodyning, frequency synthesis, phased locked looped, signal filtering and automatic control circuits.
01.14 Analyze, troubleshoot and adjust radio frequency (RF) power amplifier circuits for AM radio transmitters.
01.15 Analyze, troubleshoot and adjust AM stereo transmitter and receiver circuits.

02.0 DEMONSTRATE PROFICIENCY IN DOUBLE SIDE BAND AND SINGLE SIDE BAND RADIO SYSTEMS--The student will be able to:

02.01 Describe the operation of double side band suppressed carrier (DSSC) radio systems.
02.02 Identify the stages of DSSC radio transmitters and receivers.
02.03 Analyze and troubleshoot DSSC transmitter and receiver circuits.
02.04 Conduct operating systems check of DSSC circuits and make minor adjustments.
02.05 Describe the operation of single side band (SSB) radio systems.
02.06 Identify the stages of SSB radio transmitters and receivers.
02.07 Analyze and troubleshoot SSB transmitter and receiver circuits.
02.08 Conduct operating systems check of SSB circuits and make minor adjustments.
02.09 Set up and adjust SSB and DSSC antenna systems using power meters and SWR meters.
02.10 Analyze or measure SSB and DSSC radio circuits using spectrum analyzers, noise analyzers, impedance bridges, sweep generators, dummy loads and phase meters.
02.11 Analyze and measure SSB and DSSC radio signals using power meters, field strength meters and distortion meters.
02.12 Analyze, troubleshoot and adjust SSB and DSSC heterodyning, frequency synthesis, phased locked looped, signal filtering and

automatic control circuits.

02.13 Analyze, troubleshoot nd adjust RF power amplifier circuits for SSB and DSSC radio transmitters.

03.0 DEMONSTRATE PROFICIENCY IN FREQUENCY MODULATED RADIO TRANSMITTER AND RECEIVER SYSTEMS--The student will be able to:

03.01 Describe the operation of frequency modulated (FM) radio systems.
03.02 Identify the stages of FM radio transmitters and receivers.
03.03 Define principles of FM modulation.
03.04 Analyze and troubleshoot FM transmitter and receiver circuits.
03.05 Align IF circuits using and FM signal generator and sweep generator.
03.06 Measure IF section bandwidth using an oscilloscope or spectrum analyzer.
03.07 Measure receiver input voltage sensitivity to receiver antenna input using a signal to noise ratio meter or spectrum analyzer.
03.08 Conduct operating systems check of FM transmitter and receiver circuits and make minor adjustments.
03.09 Analyze and troubleshoot FM stereo transmitter, receiver and digital tuning circuits.
03.10 Conduct operating systems check of broad band FM stereo transmitter and receiver circuits and make minor adjustments.
03.11 Analyze, troubleshoot and adjust the standard FM right and left channel subcarrier and the subsidiary carrier authority (SCA) signal.
03.12 Analyze, troubleshoot and adjust phase modulation circuits.
03.13 Analyze, troubleshoot and adjust FM pulse modulation circuits.
03.14 Analyze, troubleshoot and adjust FM multiplex circuits.
03.15 Analyze, troubleshoot and adjust wide band and narrow band FM transceiver circuits.
03.16 Set up and adjust FM antenna systems using a power meter and SWR meter.
03.17 Analyze or measure FM radio circuits using spectrum analyzers, noise analyzers, impedance bridges, sweep generators, dummy loads and phase meters.
03.18 Analyze and measure FM radio signals using power meters, field strength meters and distortion meters.
03.19 Analyze, troubleshoot and adjust FM heterodyning, frequency synthesis, phased locked looped, signal filtering and automatic control circuits.
03.20 Analyze, troubleshoot and adjust RF power amplifier circuits for FM radio transmitters.

04.0 DEMONSTRATE PROFICIENCY IN HIGH FREQUENCY AM AND FM TWO-WAY RADIO SYSTEMS--The student will be able to:

04.01 Apply Federal Communications Commission (FCC) rules and regulations to communication requirements.
04.02 Describe the operation of high frequency (HF), very high frequency (VHF) and ultra high frequency (UHF) AM and FM two-way radio systems.
04.03 Identify the stages of HF, VHF and UHF AM and FM two-way radio systems.
04.04 Analyze and troubleshoot HF, VHF and UHF AM and FM two-way radio transmitter and receiver circuits.
04.05 Set up and adjust HF, VHF and UHF AM and FM antenna systems.
04.06 Analyze and troubleshoot the DC remote control on repeater and remoted base auxiliary equipment.
04.07 Analyze and troubleshoot the tone remote control on repeater and remoted base auxiliary equipment.
04.08 Analyze and troubleshoot the local remote control on repeater and

remote base auxiliary equipment.

04.09 Analyze and troubleshoot the RF remote control on repeater and remoted base auxiliary equipment.

04.10 Explain paging and mobile phone communications theory and language.

04.11 Analyze and troubleshoot paging and mobile phone two-tone and five-tone paging and digital formats.

04.12 Analyze and troubleshoot paging and mobile phone signaling and operation.

04.13 Service and repair cellular mobile phones and pagers.

05.0 DEMONSTRATE PROFICIENCY IN MICROWAVE SYSTEMS--The student will be able to:

05.01 Describe the operation of microwave transmission systems.

05.02 Identify the components of microwave transmission systems.

05.03 Analyze and troubleshoot microwave transmitter and receiver circuits.

05.04 Conduct operating systems checks of microwave transmitters and receivers and make minor adjustments.

05.05 Identify local codes and deed restrictions applicable to site surveys for microwave installations.

05.06 Set up and adjust microwave antenna systems.

05.07 Measure microwave system power and SWR.

05.08 Describe procedures to interface a microwave system to a public switched telephone network.

06.0 DEMONSTRATE PROFICIENCY IN SATELLITE SYSTEMS--The student will be able to:

06.01 Describe the operation of satellite systems.

06.02 Identify the components of satellite systems.

06.03 Describe the process of time division multiplexing and frequency division multiplexing used with satellite transponders.

06.04 Analyze, troubleshoot and adjust satellite transponder circuits using a high frequency sweep generator and frequency counter.

06.05 Analyze and troubleshoot video and audio demodulators in satellite receivers.

06.06 Determine location data for satellites.

06.07 Identify local codes and deed restrictions applicable to site surveys for satellite systems.

06.08 Set up and adjust satellite antenna systems.

06.09 Analyze and troubleshoot a satellite receiver low noise amplifier and down converter.

06.10 Describe procedures to interface satellite systems with two-way up link and down link communications equipment.

07.0 DEMONSTRATE PROFICIENCY IN VIDEO SYSTEMS--The student will be able to:

07.01 Analyze and adjust the composition of video signals.

07.02 Define the principles of video signal generation.

07.03 Describe the principles of video multiplex circuits.

07.04 Analyze and adjust black and white and color display circuits.

07.05 Analyze, troubleshoot and adjust the color component of a signal.

07.06 Analyze, troubleshoot and adjust the luminance component of a signal.

07.07 Analyze and troubleshoot the synchronous, horizontal and vertical components of a signal.

07.08 Measure the signal-to-noise ratio for video signals.

07.09 Analyze video circuits using a spectrum analyzer.

07.10 Interconnect video system components using coaxial cables.

07.11 Analyze, troubleshoot and adjust video and RF distribution systems.

07.12 Analyze and adjust a modulator for a video distribution system.

08.0 DEMONSTRATE PROFICIENCY IN COMMERCIAL AUDIO SYSTEMS--The student will be able to:

08.01 Describe the functions of communication system audio components.
08.02 Analyze, troubleshoot and adjust audio amplifier components and speaker system components.
08.03 Define the application of microphone and speaker systems.
08.04 Describe the application of wireless microphones with frequency diversity and the use of equalizers and time delay systems.
08.05 Determine the impedance and power requirements of microphones and speakers.

09.0 DEMONSTRATE PROFICIENCY IN DATA COMMUNICATIONS--The student will be able to:

09.01 Describe the operation of data communications systems.
09.02 Identify the components of data communications systems.
09.03 Analyze and define data communication codes, formats and protocols.
09.04 Identify serial and parallel ports and explain their use.
09.05 Describe the principles of synchronous and asynchronous data transmission systems.
09.06 Identify types of modems and modulation techniques.
09.07 Set up and operate modems.
09.08 Isolate problems of modem operation or common carrier lines.
09.09 Analyze and troubleshoot modems.
09.10 Identify and describe types of carrier systems.
09.11 Interconnect systems using the RS-232 interface standard.
09.12 Describe the operation and bus architecture of local area networks.
09.13 Analyze and troubleshoot base band and broad band local area networks.
09.14 Identify telephone terms and procedures for interfacing wire lines with data networks.
09.15 Analyze and troubleshoot the data communications systems associated with automatic teller machines and credit card readers.
09.16 Describe the operation of lasers used with data transmission.

10.0 DEMONSTRATE PROFICIENCY IN FIBER OPTIC COMMUNICATIONS SYSTEMS--The student will be able to:

10.01 Identify and describe the basic characteristics of optics such as reflection, refraction and total reflection.
10.02 Identify the characteristics and components of fiber optic cables.
10.03 Describe the modes of propagation used in fiber optic cables.
10.04 Identify bandwidth and attenuation limitations for fiber optic systems.
10.05 Describe the technique of wavelength multiplexing in fiber optic cables.
10.06 Identify and describe the characteristics of various types of light sources and light emitting diodes used for fiber optic systems.
10.07 Identify and describe the components of fiber optic transmission systems.
10.08 Assemble a simple fiber optic data transmission system.
10.09 Analyze and troubleshoot the components of fiber optic data transmission systems.
10.10 Describe the procedures used to interface fiber optic systems with microwave and satellite data transmission systems.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Identify characteristics of the American enterprise system.
15.02 Define inflation and deflation.
15.03 Illustrate the basic economic questions facing any society.
15.04 Determine the results of a change in demand or a change in supply.

15.05 List factors which contribute to economic growth.
15.06 Identify characteristics of different types of business ownership.
15.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Computer Electronics Technology

CODE NUMBER: Secondary ________ Postsecondary I470104

Florida CIP 0647.010400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMP SVC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as data processing equipment repairers (85705606) and computer service technicians (003.161-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to, installation, programming, operation, maintenance and servicing of computer systems; and diagnosis and correction of operational problems in computers arising from mechanical, electrical or electronics malfunctions.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade

level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours when content from the Florida common core electronics program (Electronics Technology) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in computer systems architecture.
02. Demonstrate proficiency in software fundamentals.
03. Demonstrate proficiency in communication interfacing
04. Demonstrate proficiency in peripheral equipment.
05. Demonstrate proficiency in site requirements and considerations.
06. Demonstrate proficiency in customer relations.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate math skills.
09. Demonstrate appropriate understanding of basic science.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Computer Electronics Technology POSTSECONDARY NUMBER: I470104

01.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

01.01 Draw and explain systems configurations in block detail.
01.02 Interpret computer acronyms.
01.03 Identify and define priorities and interrupts at system level.
01.04 Define and list direct memory access handling systems.
01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
01.06 Troubleshoot a microcomputer system.

02.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

02.01 Load and run operating system software.
02.02 Load and run diagnostic software and utilities.
02.03 Construct flow charts.
02.04 Analyze flow charts.
02.05 Identify and define computer languages and their uses.
02.06 Write a simple computer program in BASIC.
02.07 Read a PROM.
02.08 Erase and program an EPROM.
02.09 Analyze firmware concepts.
02.10 Troubleshoot firmware using defined hardware.
02.11 Analyze firmware writing concepts.

03.0 DEMONSTRATE PROFICIENCY IN COMMUNICATION INTERFACING--The student will be able to:

03.01 Identify and define serial and parallel interface standards.
03.02 Identify, define and configure sync and async devices.
03.03 Demonstrate the use of interface devices.
03.04 Identify and define networking levels.
03.05 Identify and define protocols.
03.06 Troubleshoot and repair network systems.
03.07 Identify and define multiuser systems.

04.0 DEMONSTRATE PROFICIENCY IN PERIPHERAL EQUIPMENT--The student will be able to:

04.01 Install, analyze and troubleshoot interface controllers.
04.02 Install, analyze and troubleshoot display terminals.
04.03 Install, analyze and troubleshoot printer.
04.04 Install, analyze and troubleshoot magnetic tape equipment.
04.05 Install, analyze and troubleshoot disk drive equipment.
04.06 Define environmental requirements for peripherals and media.

05.0 DEMONSTRATE PROFICIENCY IN SITE REQUIREMENTS AND CONSIDERATIONS--The student will be able to:

05.01 Apply effective customer relations.
05.01 Follow installation procedures.
05.02 Calculate and determine power requirements.
05.03 Calculate and determine environmental requirements.
05.04 List and perform preventative maintenance techniques and

requirements.

06.0 DEMONSTRATE PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

06.01 Describe effective listening techniques.
06.02 Describe techniques for instilling customer confidence.
06.03 Describe techniques for keeping the customer informed.
06.04 Demonstrate proper follow-up techniques.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make appropriate job changes.
10.09 Demonstrate acceptable employee health habits.

10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Identify characteristics of the American enterprise system.
11.02 Define inflation and deflation.
11.03 Illustrate the basic economic questions facing any society.
11.04 Determine the results of a change in demand or a change in supply.
11.05 List factors which contribute to economic growth.
11.06 Identify characteristics of different types of business ownership.
11.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Computer Engineering Technology

CODE NUMBER: Secondary _____ Postsecondary _________

Florida CIP 0615.040200

SECONDARY SCHOOL CREDITS______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other _______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: This program is designed to prepare students for employment as computer engineering technicians and in related occupations in electronics or to provide supplemental training for persons currently or previously employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program. The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

This specialization content includes, but is not limited to, computer systems architecture, software, communications, programming and analysis and design of computer systems.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills. The computational skills should include algebra and trigonometry.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate in Science Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in computer systems architecture.
02. Demonstrate proficiency in software fundamentals.
03. Demonstrate proficiency in communication interfacing.
04. Demonstrate proficiency in peripheral equipment.
05. Demonstrate proficiency in customer site requirements and considerations.
06. Demonstrate proficiency in customer relations.
07. Demonstrate proficiency with high-level computer programming languages.
08. Demonstrate proficiency in computer networking techniques.
09. Demonstrate proficiency in the use of microcomputer disk operating system services and functions.
10. Demonstrate proficiency in analysis and design of data communications systems.
11. Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Computer Engineering Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

01.01 Draw and explain systems configurations in block detail.
01.02 Interpret computer acronyms.
01.03 Identify and define priorities and interrupts at system level.
01.04 Define and list direct memory access handling systems.
01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
01.06 Troubleshoot a microcomputer system.

02.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

02.01 Load and run operating system software.
02.02 Load and run diagnostic software and utilities.
02.03 Construct flow charts.
02.04 Analyze flow charts.
02.05 Identify and define computer languages and their uses.
02.06 Write a simple computer program in BASIC.
02.07 Read a PROM.
02.08 Erase and program an EPROM.
02.09 Analyze firmware concepts.
02.10 Troubleshoot firmware using defined hardware.
02.11 Analyze firmware writing concepts.

03.0 DEMONSTRATE PROFICIENCY IN COMMUNICATION INTERFACING--The student will be able to:

03.01 Identify and define serial and parallel interface standards.
03.02 Identify, define and configure sync and async devices.
03.03 Demonstrate the use of interface devices.
03.04 Identify and define networking levels.
03.05 Identify and define protocols.
03.06 Troubleshoot and repair network systems.
03.07 Identify and define multiuser systems.

04.0 DEMONSTRATE PROFICIENCY IN PERIPHERAL EQUIPMENT--The student will be able to:

04.01 Install, analyze and troubleshoot interface controllers.
04.02 Install, analyze and troubleshoot display terminals.
04.03 Install, analyze and troubleshoot printer.
04.04 Install, analyze and troubleshoot magnetic tape equipment.
04.05 Install, analyze and troubleshoot disk drive equipment.
04.06 Define environmental requirements for peripherals and media.

05.0 DEMONSTRATE PROFICIENCY IN CUSTOMER SITE REQUIREMENTS AND CONSIDERATIONS--The student will be able to:

05.01 Apply effective customer relations.
05.01 Follow installation procedures.
05.02 Calculate and determine power requirements.
05.03 Calculate and determine environmental requirements.
05.04 List and perform preventative maintenance techniques and

requirements.

06.0 DEMONSTRATE PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

06.01 Describe effective listening techniques.
06.02 Describe techniques for instilling customer confidence.
06.03 Describe techniques for keeping the customer informed.
06.04 Demonstrate proper follow-up techniques.

07.0 DEMONSTRATE PROFICIENCY WITH HIGH-LEVEL COMPUTER PROGRAMMING LANGUAGES--The student will be able to:

07.01 Write a technical program in a high-level programming language (e.g. Fortran, Cobol, Basic, C) and associated system level concepts.
07.02 Identify and define associated system level concepts.
07.03 Apply structured programming such as loop structures, sorting techniques, data structures and arithmetic operations.

08.0 DEMONSTRATE PROFICIENCY IN COMPUTER NETWORKING TECHNIQUES--The student will be able to:

08.01 Identify and define computer networking techniques.
08.02 Design a system using hardware and software communication protocols.
08.03 Apply management techniques for network software.

09.0 DEMONSTRATE PROFICIENCY IN THE USE OF MICROCOMPUTER DISK OPERATING SYSTEM SERVICES AND FUNCTIONS--The student will be able to:

09.01 Describe the historical development of computer operating systems.
09.02 Describe the major hardware and related software subsystems of microcomputer DOS (Disk Operating System).
09.03 Describe various disk formats.
09.04 Program using assembly language to access the ROM-BIOS (Read-Only Memory-Basic Input/Output System) feature for peripheral control and serial communications.
09.05 Describe the extended services of enhanced systems.
09.06 Describe design decisions involved in implementing Input/Output (I/O) interfacing using interrupts.
09.07 Program using assembly language to implement I/O device interfacing using interrupts.
09.08 Program using the extended DOS functions.
09.09 Analyze and design software systems using ROM-BIOS, DOS functions and interrupts for use in a multiplexed analog to digital system.
09.10 Analyze and design software systems using ROM-BIOS functions and interrupts for use in a synchronous digital data system.

10.0 DEMONSTRATE PROFICIENCY IN ANALYSIS AND DESIGN OF DATA COMMUNICATIONS SYSTEMS--The student will be able to:

10.01 Describe the different types of digital data communications systems.
10.02 Describe data formats and transmission rates in serial data communications systems.
10.03 Design the connections and programming for a UART (Universal Asynchronous/Synchronous Receiver Transmitter) in a microprocessor-based system.
10.04 Identify and define available options for integration of a display terminal in a data communication system.
10.05 Identify and define communication signals and protocol for MODEM

(Modulator Demodulator) links.
10.06 Apply digital modulation techniques including PAM (Pulse-Amplitude Modulation), PCM (Pulse-Code Modulation), PWM (Pulse-Width Modulation) and delta modulation.
10.07 Analyze and design circuits for generation and detection of digital modulation.
10.08 Apply error detection and correction in digital communication systems.
10.09 Define communication protocols.
10.10 Design and apply multiplexing techniques for computer.

11.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS AND DESIGN OF PERIPHERAL EQUIPMENT USED IN COMPUTER SYSTEMS--The student will be able to:

11.01 Design and analyze circuits used in various functions of video display systems.
11.02 Analyze various types of disk drives and disk drive controllers.
11.03 Analyze various types of printers and plotters and their related interface controllers.
11.04 Analyze and design circuits for sweep generation and synchronization in a CRT (Cathode-Ray Tube) display.
11.05 Describe the use of RAM (Random-Access Memory) and ROM (Read-Only Memory) for font generation in video display systems.
11.06 Design the serial communication interface in a video.
11.07 Modulation and interval timing techniques.
11.08 Pointing devices for computer systems.
11.09 Analyze the operation of mechanical and optical pointing devices used in computer systems.
11.10 Describe the functions of the major blocks in a dot matrix printer.
11.11 Analyze and design circuits to communicate using a standard Centronics parallel interface in a printer.
11.12 Describe the main functional blocks of a roller bed plotter.
11.13 Analyze and design subsystems including interfaces for use in a roller bed plotter.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Identify characteristics of the American enterprise system.
16.02 Define inflation and deflation.
16.03 Illustrate the basic economic questions facing any society.
16.04 Determine the results of a change in demand or a change in supply.
16.05 List factors which contribute to economic growth.
16.06 Identify characteristics of different types of business ownership.
16.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Computer Integrated Manufacturing Technology

CODE NUMBER: Secondary ________ Postsecondary ________

Florida CIP 0615.049901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: This program is designed to prepare students for employment as mechanical engineering technicians (22511227), automation equipment technicians (638.261-010) and in related occupations in electronics; or to provide supplemental training to persons previously or currently employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program.

The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

This specialization content includes, but is not limited to, calibration of production line equipment, integration of controllers with workcells, bar code tracking systems, vision systems, retrieval systems, production planning operating and maintaining production equipment and test instruments, CIM systems analysis, data communications, CAD systems and quality assurance.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. students should be able to use the test equipment found in the laboratory in the electronics industry for the purpose of analyzing, troubleshooting and repairing electronics circuitry and automated equipment.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills. The computational skills should include algebra and trigonometry.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for

each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate in Science Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in machines and mechanisms.
02. Demonstrate proficiency in manufacturing processes.
03. Demonstrate proficiency in operating and maintaining manufacturing equipment for automated assembly.
04. Demonstrate proficiency in evaluating the efficiency and performance of individual production line equipment.
05. Demonstrate proficiency in integrating production equipment with workcells, programmable logic controllers and area controllers.
06. Demonstrate proficiency in bar coding, automatic tracking vision systems and automatic storage and retrieval systems for materials handling.
07. Demonstrate proficiency in manufacturing software applications used for production planning, quality control and shop floor data collection.
08. Demonstrate proficiency in programming and controlling production machines in a flexible automation environment.
09. Demonstrate proficiency in operating and maintaining production test equipment and instruments.
10. Demonstrate proficiency in CIM systems analysis.
11. Demonstrate proficiency in installing, maintaining and understanding network and data communications devices.
12. Demonstrate proficiency in basic use of computer assisted drafting and design equipment used in a manufacturing environment.
13. Demonstrate proficiency in use of quality assurance methods and statistical process control techniques.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Computer Integrated Manufacturing Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN MACHINES AND MECHANISMS--The student will be able to:

01.01 Identify, define and analyze various electromechanical systems, including pneumatic, hydraulic and electrical.
01.02 Construct flow diagrams of electromechanical system.
01.03 Analyze and identify mechanical linkages (gears, pulleys, limit switches, etc.).
01.04 Analyze and identify electromechanical devices (motors, servos, relays, stepping switches, timing devices, etc.).
01.05 Analyze and identify sensing elements.
01.06 Analyze and identify optical canning and encoding/decoding devices.
01.07 Analyze and identify error sensing/feedback and control mechanisms.

02.0 DEMONSTRATE PROFICIENCY IN MANUFACTURING PROCESSES--The student will be able to:

02.01 Understand current manufacturing processes.
02.02 Understand the use of current manufacturing machines, operating systems and mechanisms.
02.03 Understand hydraulic, electrical and pneumatic devices used in production assembly and materials handling.
02.04 Understand OSHA, state, and local safety requirements for the manufacturing and assembly operations with automated equipment.
02.05 Understand manpower needs and skills needed in assembly operations.
02.06 Understand integration requirements for charging conventional manufacturing to CIM.
02.07 Understand the criteria for tool design, maintenance, procurement and handling.
02.08 Understand gage design, usage and limitations.
02.09 Understand the requirements and solutions for raw materials orientation and clamping.
02.10 Analyze and recommend the usage of jigs and fixtures, including effectors and special grippers for robotics.
02.11 Understand the concepts and considerations required for products manufactured from sheet metal.
02.12 Understand the special equipment required for sheet metal fabrication and forming.
02.13 Understand concepts of injection molding equipment.
02.14 Understand the concepts involved in the process of designing and fabricating specialized tools for numerical controlled machine application.
02.15 Understand the concepts and special considerations involved with operating computer numerical control equipment.
02.16 Understand the functions of the industrial computer and microprocessor controls in modern manufacturing.

03.0 DEMONSTRATE PROFICIENCY IN OPERATING AND MAINTAINING MANUFACTURING EQUIPMENT FOR AUTOMATED ASSEMBLY--The student will be able to:

03.01 Interpret blueprints, schematics and technical manuals.
03.02 Establish routine operations involving maintenance schedules.

03.03 Analyze system failures.
03.04 Perform minor repairs to CIM systems.
03.05 Coordinate and specify maintenance service.
03.06 Evaluate need for equipment replacement, overhaul and retooling.

04.0 DEMONSTRATE PROFICIENCY IN EVALUATING THE EFFICIENCY AND PERFORMANCE OF INDIVIDUAL PRODUCTION LINE EQUIPMENT--The student will be able to:

04.01 Design the routing, storage and procurement/distribution systems for raw and finished products.
04.02 Analyze and utilize statistical data from process control systems.
04.03 Describe the relationship of equipment utilization to the manufacturing economy.
04.04 Prepare and evaluate justifications for specification deviations.

05.0 DEMONSTRATE PROFICIENCY IN INTEGRATING PRODUCTION EQUIPMENT WITH WORKCELLS, PROGRAMMABLE LOGIC CONTROLLERS AND AREA CONTROLLERS--The student will be able to:

05.01 Design analog and digital control systems along with applicable software to specific manufacturing requirements.
05.02 Chart and analyze ladder logic diagrams for manufacturing processes.
05.03 Develop and analyze flow charts from ladder diagrams and related process controls.
05.04 Operate Programmable Logic Controllers with device drivers.
05.05 Apply software to workcells and area controllers.
05.06 Integrate control systems and equipment with production and production support mechanisms.

06.0 DEMONSTRATE PROFICIENCY IN BAR CODING, AUTOMATIC TRACKING VISION SYSTEMS AND AUTOMATIC STORAGE AND RETRIEVAL SYSTEMS FOR MATERIALS HANDLING--The student will be able to:

06.01 Describe automatic inventory accounting and control system.
06.02 List the underlying principles and method of controlling work in progress.
06.03 Analyze product flow cycle.
06.04 Describe warehouse throughput systems.
06.05 Implement automated tracking in the laboratory environment.
06.06 Describe machine vision applications.
06.07 Maintain machine vision and sensing system equipment.

07.0 DEMONSTRATE PROFICIENCY IN MANUFACTURING SOFTWARE APPLICATIONS USED FOR PRODUCTION PLANNING, QUALITY CONTROL AND SHOP FLOOR DATA COLLECTION--The student will be able to:

07.01 Apply proficiency in manufacturing software application packages.
07.02 Analyze data collection systems for maintaining the progress of each order.
07.03 Assign and maintain priorities of individual orders.

08.0 DEMONSTRATE PROFICIENCY IN PROGRAMMING AND CONTROLLING PRODUCTION MACHINES IN A FLEXIBLE AUTOMATION ENVIRONMENT--The student will be able to:

08.01 Define and analyze product manufacturing requirements and process.
08.02 Identify the responsibilities of management in produced production.
08.03 Integrate personnel, hardware and software capabilities for the timely completion of product manufacturing.

08.04 Describe the relationship of quality assurance and manufacturing.
08.05 Apply the basic principles underlying the relationship between systems design, production and manufacturing engineering.
08.06 Apply manufacturing simulation packages used in layout and design of production operations.
08.07 Apply manufacturing resources planning and just-in-time concepts in production planning operations.
08.08 Apply engineering economy factors in equipment justification.
08.09 Apply microprocessor controls to a modern manufacturing system.

09.0 DEMONSTRATE PROFICIENCY IN OPERATING AND MAINTAINING PRODUCTION TEST EQUIPMENT AND INSTRUMENTS--The student will be able to:

09.01 Specify, interconnect and operate instruments and test equipment.
09.02 Analyze normal and abnormal instrument readings and their probable causes.
09.03 Specify and operate Automatic Test Equipment (ATE) procedures, using required software and hardware.
09.04 Troubleshoot control systems mechanisms and software.
09.05 Repair faults in production equipment and specify external repairs or overhaul requirements.
09.06 Align, calibrate and maintain related ATE interfaces and circuits.
09.07 Prepare error probability charts and graphs.

10.0 DEMONSTRATE PROFICIENCY IN CIM SYSTEMS ANALYSIS--The student will be able to:

10.01 Describe the concepts of a generic CIM system.
10.02 Analyze and identify problems with the operation of industrial computers, controllers and hardware.
10.03 Utilize typical screens and files available to shop floor operations for troubleshooting and data collection.
10.04 Operate industrial terminals, input/output communications interface devices, etc., found in the manufacturing environment.

11.0 DEMONSTRATE PROFICIENCY IN INSTALLING, MAINTAINING AND UNDERSTANDING NETWORK AND DATA COMMUNICATIONS DEVICES--The student will be able to:

11.01 Identify and apply communications protocols.
11.02 Identify and apply networks and classifications.
11.03 Identify and apply throughput, memory size/capabilities and standards benchmark.
11.04 Identify and apply computer options for sharing directories, files and servers.
11.05 Select and apply sensors and feedback devices.
11.06 Select and interconnect cabling, repeaters, modems and multiplexers.

12.0 DEMONSTRATE PROFICIENCY IN BASIC USE OF COMPUTER ASSISTED DRAFTING AND DESIGN EQUIPMENT USED IN A MANUFACTURING ENVIRONMENT--The student will be able to:

12.01 Operate CAD systems and hardware.
12.02 Apply CAD support software to manipulate interval files, attributes, database exchange files, and set-up.
12.03 Apply CAD software to create, edit, and update drawings and files.
12.04 Identify and define protocols and software used to download CAD to CAM.
12.05 Describe the relationship and functions of CAD in the industrial production environment.

13.0 DEMONSTRATE PROFICIENCY IN USE OF QUALITY ASSURANCE METHODS AND

STATISTICAL PROCESS CONTROL TECHNIQUES--The student will be able to:

13.01 Describe the concept of quality assurance in increasing productivity and promoting zero defects.
13.02 Apply data collection methods for productivity improvement and reporting.
13.03 Analyze productivity data, identify problem areas and evaluate the cause and effect relationship.
13.04 Develop and apply quality improvement strategies.
13.05 Develop and apply QA methods and techniques for production and product handling in a CIM environment.
13.06 Understand process capability and its applications.
13.07 Use statistical quality control (SQC) tools and techniques to analyze data.

CURRICULUM FRAMEWORK　　　　　　　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Consumer Electronic Product Servicing

CODE NUMBER: Secondary ________ Postsecondary I470113

Florida CIP 0647.010301

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational Other 30, 31

CERTIFICATION COVERAGE: RADIO TV @ 7 G ELECTRONIC @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as home entertainment equipment repairers (87508608) or audio video repairers (729.281-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to, AM/FM tuners; television; antenna, transmission line systems and studio systems; and television.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry found in audio systems, tape recorders, tuners, televisions, video disc players, master antenna systems and electronic security systems

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed. Consumer

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours when combined with Electronics Technology which is a prerequisite.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in surface mounted devices.
02. Demonstrate proficiency repairing radio and television receiving systems.
03. Demonstrate proficiency in video recording and playback systems.
04. Demonstrate proficiency in video disc player systems.
05. Demonstrate proficiency in personal computer systems and video games.
06. Demonstrate proficiency in advanced audio systems (analog and digital).
07. Demonstrate proficiency in master antenna television systems (CATV/CCTV/MATV/SATV).
08. Demonstrate proficiency in electronic security systems.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　SECONDARY NUMBER:

PROGRAM TITLE: Consumer Electronic Product Servicing　　POSTSECONDARY NUMBER: I470113

01.0 DEMONSTRATE PROFICIENCY IN SURFACE MOUNTED DEVICES (SMD)--The student will be able to:

01.01 Identify types of surface mounted devices (SMD's) for DC, AC and solid-state circuits.
01.02 Identify defective SMD's using appropriate troubleshooting techniques.
01.03 Remove and replace SMD's using specialized soldering and desoldering techniques.
01.04 Properly handle static sensitive devices.

02.0 DEMONSTRATE PROFICIENCY IN RADIO AND TELEVISION RECEIVING SYSTEMS--The student will be able to:

02.01 Read and interpret radio and television receiving system block and circuit diagrams.
02.02 Determine the operational status of radio and television receiving systems.
02.03 Troubleshoot radio and television receiving systems.
02.04 Remove and replace radio and television receiving system components.
02.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
02.06 Set up and operate video analyzers.
02.07 Set up and operate National Television Signal Codes (NTSC) generators.
02.08 Set up and operate cathode ray tube (CRT) analyzers.
02.09 Set up and operate stereo generators.

03.0 DEMONSTRATE PROFICIENCY IN VIDEO RECORDING AND PLAYBACK SYSTEMS (ANALOG AND DIGITAL)--The student will be able to:

03.01 Read and interpret video recording system block and circuit diagrams.
03.02 Determine the operational status of video recording systems (mechanical and electronic).
03.03 Troubleshoot video recording systems.
03.04 Remove and replace video recording system components.
03.05 Perform operating systems check and make minor adjustments to video recording systems.
03.06 Set up and operate BETA test equipment.
03.07 Set up and operate VHS test equipment.
03.08 Set up and operate vectorscopes.

04.0 DEMONSTRATE PROFICIENCY IN VIDEO DISC PLAYER SYSTEMS--The student will be able to:

04.01 Read and interpret video disc player system block and circuit diagrams.
04.02 Determine the operational status of video disc player systems.
04.03 Troubleshoot video disc player systems.
04.04 Remove and replace video disc player system components.
04.05 Perform operating systems checks and make minor adjustments to video disc player systems.

05.0 DEMONSTRATE PROFICIENCY IN PERSONAL COMPUTER SYSTEMS AND VIDEO GAMES--The student will be able to:

- 05.01 Read and interpret computer system and video game block and circuit diagrams.
- 05.02 Determine the operational status of personal computer systems and video games.
- 05.03 Troubleshoot personal computer systems and video games.
- 05.04 Remove and replace personal computer systems and video game components.
- 05.05 Perform operating systems check and make minor adjustments to personal computer systems and video games.
- 05.06 Set up and operate logic analyzers for personal computer systems.

06.0 DEMONSTRATE PROFICIENCY IN ADVANCED AUDIO SYSTEMS (ANALOG AND DIGITAL)--The student will be able to:

- 06.01 Read and interpret advanced audio systems block and circuit diagrams.
- 06.02 Determine the operational status of advanced audio systems.
- 06.03 Troubleshoot advanced audio systems.
- 06.04 Remove and replace advanced audio system components.
- 06.05 Perform operating systems check and make minor adjustments to advanced audio systems.

07.0 DEMONSTRATE PROFICIENCY IN MASTER ANTENNA TELEVISION SYSTEMS (CATV/CCTV/MATV/SATV)--The student will be able to:

- 07.01 Design master antenna television receiving systems.
- 07.02 Determine material requirements for master antenna television receiving systems.
- 07.03 Prepare bills of material for master antenna television receiving systems.
- 07.04 Lay out and install master antenna television receiving systems.
- 07.05 Set up and operate field strength meters.
- 07.06 Determine the operational status of master antenna television receiving systems.
- 07.07 Troubleshoot master antenna television receiving systems.
- 07.08 Remove and replace master antenna television receiving system components.
- 07.09 Perform operating systems check and make minor adjustments to master antenna television receiving systems.

08.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC SECURITY SYSTEMS--The student will be able to:

- 08.01 Lay out and install electronic security systems.
- 08.02 Determine the operating status of electronic security systems.
- 08.03 Troubleshoot electronic security systems.
- 08.04 Remove and replace electronic security system components.
- 08.05 Perform operating systems check and make minor adjustments to electronic security systems.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 09.03 Read and follow written and oral instructions.
- 09.04 Answer and ask questions coherently and concisely.

09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application for correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge or how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Identify characteristics of the American enterprise system.
13.02 Define inflation and deflation.
13.03 Illustrate the basic economic questions facing any society.
13.04 Determine the results of a change in demand or a change in supply.
13.05 List factors which contribute to economic growth.
13.06 Identify characteristics of different types of business ownership.
13.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Consumer Electronic Repair

CODE NUMBER: Secondary 8730100 Postsecondary ______

Florida CIP 0647.011301

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 x 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: RADIO TV @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as radio mechanics (85514600) and radio and television repairers (720.281-018). This program also provides supplemental training for persons previously or currently employed in this occupation.

This program includes competencies of the common core of electronics program.

The course content will include the following: direct current (DC) electronics and circuits; alternating current (AC) electronics and circuits; solid-state devices and circuits; analog circuits; digital devices and circuits; microprocessing; technical recording and reporting; audio systems, AM/FM tuners, television and antenna systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that make up this program when offered at the secondary level.

8730110	Consumer Electronic Repair 1
8730120	Consumer Electronic Repair 2
8730130	Consumer Electronic Repair 3
8730140	Consumer Electronic Repair 4
8730150	Consumer Electronic Repair 5
8730160	Consumer Electronic Repair 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry found in audio systems, tape recorders, tuners and televisions.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Algebra is recommended as a prerequisite for entry into this program.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor systems.
08 Demonstrate proficiency in technical recording and reporting.
09. Demonstrate proficiency in surface mounted devices (SMD).
10. Demonstrate proficiency repairing radio and television receiving systems.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8730100

PROGRAM TITLE: Consumer Electronic Repair POSTSECONDARY NUMBER: _______

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICE--The student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
02.09 Compute conductance and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel- series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and application of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for sold-state devices.

04.15 Set up and operate power supplies for sold-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for sold-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of liner integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital, circuits.

06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog- and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze bus concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Setup and operate oscilloscopes of microprocessor systems.
07.07 Setup and operate logic-date analyzers for troubleshooting microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

09.0 DEMONSTRATE PROFICIENCY IN SURFACE MOUNTED DEVICES (SMD)--The student will be able to:

09.01 Identify types of surface mounted devices (SMD's) for DC, AC and solid-state circuits.
09.02 Identify defective SMD's using appropriate troubleshooting techniques.
09.03 Remove and replace SMD's using specialized soldering and desoldering techniques.
09.04 Handle static sensitive devices.

10.0 DEMONSTRATE PROFICIENCY IN RADIO AND TELEVISION RECEIVING SYSTEMS--The student will be able to:

10.01 Read and interpret radio and television receiving system block and circuit diagrams.
10.02 Determine the operational status of radio and television receiving systems.
10.03 Troubleshoot radio and television receiving systems.
10.04 Remove and replace radio and television receiving system components.
10.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
10.06 Set up and operate video analyzers.
10.07 Set up and operate National Television Signal Codes (NTSC) generators.
10.08 Set up and operate cathode ray tube (CRT) analyzers.
10.09 Set up and operate stereo generators.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.

13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July 1993
PROGRAM AREA: Industrial Education — COURSE CREDIT: 1
PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100
PROGRAM TITLE: Consumer Electronic Repair 1 — COURSE NUMBER: 8730110

COURSE DESCRIPTION:

This course is designed to provide instruction in laboratory practices and DC circuits.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICE--The student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
02.09 Compute conductance and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.

02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100

PROGRAM TITLE: Consumer Electronic Repair 2 — COURSE NUMBER: 8730120

COURSE DESCRIPTION:

This course is designed to provide instruction in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant

circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair
PROGRAM NUMBER: 8730100

PROGRAM TITLE: Consumer Electronic Repair 3
COURSE NUMBER: 8730130

COURSE DESCRIPTION:

This course is designed to provide instruction in solid-state devices and analog circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and application of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.

04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for sold-state devices.
04.15 Set up and operate power supplies for sold-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for sold-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of liner integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair PROGRAM NUMBER: 8730100

PROGRAM TITLE: Consumer Electronic Repair 4 COURSE NUMBER: 8730140

COURSE DESCRIPTION:

This course is designed to provide instruction in digital circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital, circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog- and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July 1993
PROGRAM AREA: Industrial Education	COURSE CREDIT: 1
PROGRAM TITLE: Consumer Electronic Repair	PROGRAM NUMBER: 8730100
PROGRAM TITLE: Consumer Electronic Repair 5	COURSE NUMBER: 8730150

COURSE DESCRIPTION:

This course is designed to provide instruction in microprocessors and technical recording and reporting.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze bus concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Setup and operate oscilloscopes of microprocessor systems.
07.07 Setup and operate logic-date analyzers for troubleshooting microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair

PROGRAM NUMBER: 8730100

PROGRAM TITLE: Consumer Electronic Repair 6

COURSE NUMBER: 8730160

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing radio and television receiving systems, employability skills and entrepreneurship.

09.0 DEMONSTRATE PROFICIENCY IN SURFACE MOUNTED DEVICES (SMD)--The student will be able to:

09.01 Identify types of surface mounted devices (SMD's) for DC, AC and solid-state circuits.
09.02 Identify defective SMD's using appropriate troubleshooting techniques.
09.03 Remove and replace SMD's using specialized soldering and desoldering techniques.
09.04 Handle static sensitive devices.

10.0 DEMONSTRATE PROFICIENCY IN RADIO AND TELEVISION RECEIVING SYSTEMS--The student will be able to:

10.01 Read and interpret radio and television receiving system block and circuit diagrams.
10.02 Determine the operational status of radio and television receiving systems.
10.03 Troubleshoot radio and television receiving systems.
10.04 Remove and replace radio and television receiving system components.
10.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
10.06 Set up and operate video analyzers.
10.07 Set up and operate National Television Signal Codes (NTSC) generators.
10.08 Set up and operate cathode ray tube (CRT) analyzers.
10.09 Set up and operate stereo generators.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Cosmetology

CODE NUMBER: Secondary 8757000 Postsecondary I120403

Florida CIP 0612.040300

SECONDARY SCHOOL CREDITS 8 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: COSMETOL @ 7 G PERS SERV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare a person for employment as hairdressers, cosmetologist (68005446) or to provide supplemental training for persons previously or currently employed in this occupation. Instruction is designed to qualify students for employment upon successfully passing the Florida cosmetology license examination.

The content includes, but is not limited to, communication skills, leadership skills, human relations skills and employability skills, safe and efficient work practices; Florida cosmetology law and rules, acquisition of knowledge of cosmetology and its related chemistry, bacteriology, anatomy and physiology; development of skill in performing the manipulative technique required in the practice of cosmetology.

Listed below are the courses that comprise this program when offered at the secondary level:

8757010	Cosmetology 1
8757020	Cosmetology 2
8757030	Cosmetology 3
8757040	Cosmetology 4
8757050	Cosmetology 5
8757060	Cosmetology 6
8757070	Cosmetology 7
8757080	Cosmetology 8

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with chemicals, implements, and equipment appropriate to the programs' content and in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 9.0. This grade level number

corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The length of this program is 1200 hours. Students may concentrate as a Nail Technician by completing 150 hours and a minimum of 50 service competencies 1, 7, 9 and 10; and obtaining a registration from the State Board of Cosmetology; or as a Skin Care Specialist by completing 300 hours and a minimum of 40 services in competencies 1 and 8 through 10; and obtaining a registration from the State Board of Cosmetology.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Employ proper laboratory practices.
02. Perform and identify shampoo/hair conditioner and scalp treatment.
03. Identify and perform hair sculpting (cutting).
04. Identify and perform hair styles and attaching hair.
05. Permanent waving/reconstruction curl/chemical relaxing.
06. Identify and apply temporary semi-permanent and permanent color/bleach and specialty color techniques.
07. Perform manicure/pedicure/apply artificial nails/nail wraps.
08. Identify and perform facials, massage, make-up, hair removal, artificial lash application.
09. Demonstrate knowledge of employability skills/Florida law.
10. Demonstrate entrepreneurship.
11. Identify Cosmetology Professional Development Program (Level 1 and 2).
12. Demonstrate knowledge of Cosmetology Professional Development Program (level 3 and 4).

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8757000

PROGRAM TITLE: Cosmetology POSTSECONDARY NUMBER: I120403

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and to all procedures.
01.02 Set up and operate equipment and utilize materials.
01.03 Clean and maintain implements and equipment.
01.04 Demonstrate professional ethics with patrons and co-workers.
01.05 Analyze and recognize hair, skin, scalp, and nail conditions.
01.06 Analyze hair, skin, scalp and nail products using pH scale.
01.07 Identify the histology/trichology of skin, hair and nails.
01.08 Exhibit professional occupational skills.

02.0 PERFORM AND IDENTIFY SHAMPOO/HAIR CONDITIONER AND SCALP TREATMENTS--The student will be able to:

02.01 Prepare the patron.
02.02 Analyze and recognize hair and scalp condition.
02.03 Select appropriate products (shampoo, conditioners, scalp treatments).
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo thoroughly from hair and scalp.
02.06 Select appropriate hair or scalp conditioners/treatment (reconstructor, acid rinse, moisturizer, detangler, oily scalp, dry scalp, or dandruff treatment).
02.07 Apply treatment or conditioner according to manufacturer's directions.
02.08 Perform scalp manipulation, if required.
02.09 Set up and operate electrical equipment as required (high frequency currents, ultra violet or infra red rays).
02.10 Remove conditioner or treatment, if required.

03.0 IDENTIFY AND PERFORM HAIR SCULPTING (CUTTING)--The student will be able to:

03.01 Prepare the patron and determine needs and desires (consultation).
03.02 Select and utilize hair cutting implements and techniques scissors, razor, clippers, texturizing implements).
03.03 Section hair and proceed with wet or dry hair cut utilizing all elevations (solid form, graduated, layered, over-directed) and combinations with or without blends.
03.04 Edge and clean neckline with razor, clipper or scissors.
03.05 Check completed cut.
03.06 Sanitize cutting implements using Universal Sanitation Procedures.

04.0 IDENTIFY AND PERFORM HAIR STYLES AND ATTACHING HAIR--The student will be able to:

04.01 Prepare patron and determine needs and desired style (consultation).
04.02 Identify and perform wet set using principles of design (hair sculpting, rollers, of fingerwaves).
04.03 Prepare and perform thermal styling using electric rollers, blow dryers, curling irons, crimping irons, air weaving combs using principles of design.
04.04 Comb out into desired style.
04.05 Utilize braiding technique.

04.06 Style hairpieces.
04.07 Attach and blend hairpiece into desired style.

05.0 PERMANENT WAVING/RECONSTRUCTION CURL/ CHEMICAL RELAXING--The student will be able to:

05.01 Prepare patron and determine needs and desired style (consultation).
05.02 Analyze hair, check scalp.
05.03 Select appropriate solution/pH according to hair texture, desired results.
05.04 Perform shampoo and shaping as required.
05.05 Apply protective cream or lotion.
05.06 Apply rearranger or straightener as required for desired results following curl or chemical relaxer.
05.07 Stand test for straightness if performing reconstruction curl or chemical relaxer.
05.08 Rinse or shampoo according to manufacturer's directions.

05.09 Select rods and wrap hair, if required, according to manufacturer's directions.
05.10 Apply processing solution and process, take test curls.
05.11 Rinse, blot, shampoo and/or neutralize.
05.12 Remove rods, condition and style, record results.
05.13 Apply leave-on treatment, if required.

06.0 IDENTIFY AND APPLY TEMPORARY SEMI-PERMANENT AND PERMANENT COLOR/BLEACH AND SPECIALTY COLOR TECHNIQUES -- The student will be able to:

06.01 Perform patch, if required.
06.02 Prepare patron, determine needs and desires (consultation).
06.03 Analyze scalp and hair.
06.04 Select and assemble appropriate solutions according to hair texture and desired results.
06.05 Section hair, if required.
06.06 Mix, if required, and apply color, toner, and/or bleach according to manufacturer's directions.
06.07 Perform strand tests.
06.08 Identify and perform specialty coloring techniques.
06.09 Record results.

07.0 PERFORM MANICURE/PEDICURE/APPLY ARTIFICIAL NAILS/NAIL WRAPS. -- The student will be able to:

07.01 Prepare patron, determine needs and desires (consultation).
07.02 Sanitize, assemble supplies and equipment.
07.03 Remove polish/clean under nails.
07.04 Soften, push back cuticles, trim hangnails, shape nails.
07.05 Smooth or buff nails.
07.06 Sanitize, soak and clean feet and under nails (pedicure.)
07.07 Prepare nails.
07.08 Size and apply artificial nails according to manufacturer's directions.
07.09 Apply nail wraps according to manufacturer's directions.
07.10 Apply nail forms, if required.
07.11 Apply sculptured nail product, shape and buff.
07.12 Apply product to form and overlay according to manufacturer's directions.
07.13 Remove artificial nails.
07.14 Massage hands/feet.
07.15 Apply polish.

08.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, MAKEUP, HAIR REMOVAL, ARTIFICIAL LASH APPLICATION -- The student will be able to:

08.01 Prepare patron, determine needs and desires (consultation).
08.02 Assemble supplies and equipment.
08.03 Cleanse face and neck.
08.04 Perform appropriate treatment (manual, pack, mash, high frequency, galvanic, vacuum, steam, vibrator).
08.05 Perform final cleansing of face and neck.
08.06 Perform eyebrow and lash treatment (tint/artificial lashes).
08.07 Apply artificial lashes.
08.08 Shape eyebrows tweezing, waxing (removing superfluous hair, if necessary).
08.09 Apply basic make-up and corrective make-up.

09.0 DEMONSTRATE KNOWLEDGE OF EMPLOYABILITY SKILLS/FLORIDA LAW -- The Student will be able to:

09.01 Demonstrate working knowledge of Florida Law, Chapter 477 and Rule 21.F.
09.02 Demonstrate Universal AIDS Precaution Procedures for the salon.
09.03 Demonstrate knowledge of the "Florida Right-to-Know" Law (Chapter 442).

10.0 DEMONSTRATE ENTREPRENEURSHIP -- The Student will be able to:

10.01 Assist employees in setting personal goals.
10.02 Select workable site/location for salon.
10.03 Develop operating budget.
10.04 Develop business operations.
10.05 Demonstrate service excellence.
10.06 Write a resume.
10.07 Utilize math skills applicable to the industry.
10.08 Utilize communication skills applicable to the industry.
10.09 Fill out a job search.
10.10 Adapt to change.

11.0 IDENTIFY COSMETOLOGY PROFESSIONAL DEVELOPMENT PROGRAM (LEVELS 1 AND 2) -- The student will be able to:

11.01 Assessment inventory.

11.01.01 Use an assessment inventory.
11.01.02 Establish short term goals.
11.01.03 Decide future career.
11.01.04 Survey employment opportunities
11.01.05 Define acronym for VICA.
11.01.06 Demonstrate knowledge of VICA.
11.01.07 Demonstrate knowledge of VICA motto.
11.01.08 Demonstrate knowledge of VICA colors.
11.01.09 Demonstrate knowledge of VICA creed.
11.01.10 Demonstrate knowledge of VICA dress.
11.01.11 Be knowledgeable of procedures in becoming a VICA officer.
11.01.12 Attend local VICA meeting.
11.01.13 Participate in VICA community project.
11.01.14 Demonstrate proficiency in program competency.

12.0 DEMONSTRATE KNOWLEDGE OF COSMETOLOGY PROFESSIONAL DEVELOPMENT PROGRAM (LEVELS 3 AND 4) -- The student will be able to:

12.01 Review short term goals.

12.02 Demonstrate VICA emblem.
12.03 Serve on a VICA committee.
12.04 Prepare a meeting agenda.
12.05 Demonstrate basic knowledge of Parliamentary Procedures.
12.06 Identify State legislators and governor.
12.07 Review a trade journal article.
12.08 Prepare a three to five minute speech.
12.09 Complete a job application.
12.10 Demonstrate knowledge of the purpose of VICA.
12.11 Participate in an opening and closing team ceremony.
12.12 Demonstrate knowledge of State VICA structure.
12.13 Plan a meeting or special program.
12.14 Plan and implement a program to promote VICA.
12.15 Take part in a job interview.
12.16 Demonstrate proficiency in program competency.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology | PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 1 | COURSE NUMBER: 8757010

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom/laboratory procedures. It provides competencies in hair shampooing and scalp treatments.

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and to all procedures.
01.02 Set up and operate equipment and utilize materials.
01.03 Clean and maintain implements and equipment.
01.04 Demonstrate professional ethics with patrons and co-workers.
01.05 Analyze and recognize hair, skin, scalp, and nail conditions.
01.06 Analyze hair, skin, scalp and nail products using pH scale.
01.07 Identify the histology/trichology of skin, hair and nails.
01.08 Exhibit professional occupational skills.

02.0 PERFORM AND IDENTIFY SHAMPOO/HAIR CONDITIONER AND SCALP TREATMENTS--The student will be able to:

02.01 Prepare the patron.
02.02 Analyze and recognize hair and scalp condition.
02.03 Select appropriate products (shampoo, conditioners, scalp treatments).
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo thoroughly from hair and scalp.
02.06 Select appropriate hair or scalp conditioners/treatment (reconstructor, acid rinse, moisturizer, detangler, oily scalp, dry scalp, or dandruff treatment).
02.07 Apply treatment or conditioner according to manufacturer's directions.
02.08 Perform scalp manipulation, if required.
02.09 Set up and operate electrical equipment as required (high frequency currents, ultra violet or infra red rays).
02.10 Remove conditioner or treatment, if required.

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STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology | PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 2 | COURSE NUMBER: 8757020

COURSE DESCRIPTION:

This course is designed to provide competencies in hairshaping and instruction in the selection of proper hair cutting implements and proper style selection

03.0 IDENTIFY AND PERFORM HAIR SCULPTING (CUTTING)--The student will be able to:

03.01 Prepare the patron and determine needs and desires (consultation).
03.02 Select and utilize hair cutting implements and techniques (scissors, razor, clippers, texturizing implements).
03.03 Section hair and proceed with wet or dry hair cut utilizing all elevations (solid form, graduated, layered, overdirected) and combinations with or without blends.
03.04 Edge and clean neckline with razor, clipper or scissors.
03.05 Check completed cut.
03.06 Sanitize cutting implements using Universal Sanitation Procedures.

08.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, MAKEUP, HAIR REMOVAL, ARTIFICIAL LASH APPLICATION -- The student will be able to:

08.01 Prepare patron, determine needs and desires (consultation).
08.02 Assemble supplies and equipment.
08.03 Cleanse face and neck.
08.04 Perform appropriate treatment (manual, pack, mash, high frequency, galvanic, vacuum, steam, vibrator).
08.05 Perform final cleansing of face and neck.
08.06 Perform eyebrow and lash treatment (tint/artificial lashes).
08.07 Apply artificial lashes.
08.08 Shape eyebrows tweezing, waxing (removing superfluous hair, if necessary).
08.09 Apply basic make-up and corrective make-up.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology

PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 3

COURSE NUMBER: 8757030

COURSE DESCRIPTION:

This course is designed to provide competencies in hairstyling, preparation and principles of design and fitting of wigs and hair pieces.

04.0 IDENTIFY AND PERFORM HAIR STYLES AND ATTACHING HAIR--The student will be able to:

04.01 Prepare patron and determine needs and desired style (consultation).
04.02 Identify and perform wet set using principles of design (hair sculpting, rollers, of fingerwaves).
04.03 Prepare and perform thermal styling using electric rollers, blow dryers, curling irons, crimping irons, air weaving combs using principles of design.
04.04 Comb out into desired style.
04.05 Utilize braiding technique.
04.06 Style hairpieces.
04.07 Attach and blend hairpiece into desired style.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 4 COURSE NUMBER: 8757040

COURSE DESCRIPTION:

This course is designed to provide competencies in permanent waving and chemical hair restructuring (relaxing). Instruction in analyzing the hair, selection of approximate solutions, and implements is also provided.

05.0 PERMANENT WAVING/RECONSTRUCTION CURL/ CHEMICAL RELAXING--The student will be able to:

05.01 Prepare patron and determine needs and desired style (consultation).
05.02 Analyze hair, check scalp.
05.03 Select appropriate solution/pH according to hair texture, desired results.
05.04 Perform shampoo and shaping as required.
05.05 Apply protective cream or lotion.
05.06 Apply rearranger or straightener as required for desired results following curl or chemical relaxer.
05.07 Stand test for straightness if performing reconstruction curl or chemical relaxer.
05.08 Rinse or shampoo according to manufacturer's directions.
05.09 Select rods and wrap hair, if required, according to manufacturer's directions.
05.10 Apply processing solution and process, take test curls.
05.11 Rinse, blot, shampoo and/or neutralize.
05.12 Remove rods, condition and style, record results.
05.13 Apply leave-on treatment, if required.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetolocy 5 COURSE NUMBER: 8757050

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in hair tinting and bleaching. This instruction includes analysis of hair and scalp, performance of predisposition test, selection of correct supplies and equipment.

06.0 IDENTIFY AND APPLY TEMPORARY SEMI-PERMANENT AND PERMANENT COLOR/BLEACH AND SPECIALTY COLOR TECHNIQUES -- The student will be able to:

06.01 Perform patch, if required.
06.02 Prepare patron, determine needs and desires (consultation).
06.03 Analyze scalp and hair.
06.04 Select and assemble appropriate solutions according to hair texture and desired results.
06.05 Section hair, if required.

06.06 Mix, if required, and apply color, toner, and/or bleach according to manufacturer's directions.
06.07 Perform strand tests.
06.08 Identify and perform specialty coloring techniques.
06.09 Record results.

09.0 DEMONSTRATE KNOWLEDGE OF EMPLOYABILITY SKILLS/FLORIDA LAW -- The Student will be able to:

09.01 Perform safety and health practices.
09.02 Select employment opportunities.
09.03 Understand employment capabilities.
09.04 Demonstrate employment seeking skills.
09.05 Demonstrate appropriate work behavior.
09.06 Project the professional image.
09.07 Exhibit working relationships.
09.08 Utilize communication skills applicable to the industry.
09.09 Utilize math skills applicable to the industry.
09.10 Adapt to change.
09.11 Balance personal and professional life.
09.12 Demonstrate consumer resources and energy.
09.13 Demonstrate working knowledge of Florida Law, Chapter 477 and Rule 21.F.
09.14 Demonstrate Universal AIDS Precaution Procedures for the salon.
09.15 Demonstrate knowledge of the "Florida Right-to-Know" Law (Chapter 442).

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 6 COURSE NUMBER: 8757060

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in manicuring, pedicuring, facials and make up. This instruction includes selection of supplies and equipment, sanitation procedures and performing designated procedures.

07.0 PERFORM MANICURE/PEDICURE/APPLY ARTIFICIAL NAILS/NAIL WRAPS. -- The student will be able to:

07.01 Prepare patron, determine needs and desires (consultation).
07.02 Sanitize, assemble supplies and equipment.
07.03 Remove polish/clean under nails.
07.04 Soften, push back cuticles, trim hangnails, shape nails.
07.05 Smooth or buff nails.
07.06 Sanitize, soak and clean feet and under nails (pedicure.)
07.07 Prepare nails.
07.08 Size and apply artificial nails according to manufacturer's directions.
07.09 Apply nail wraps according to manufacturer's directions.
07.10 Apply nail forms, if required.
07.11 Apply sculptured nail product, shape and buff.
07.12 Apply product to form and overlay according to manufacturer's directions.
07.13 Remove artificial nails.
07.14 Massage hands/feet.

07.15 Apply polish.

10.0 DEMONSTRATE ENTREPRENEURSHIP -- The Student will be able to:

10.01 Assist employees in setting personal goals.
10.02 Select workable site/location for salon.
10.03 Develop operating budget.
10.04 Develop business operations.
10.05 Demonstrate service excellence.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 7 COURSE NUMBER: 8757070

COURSE DESCRIPTION:

11.0 IDENTIFY COSMETOLOGY PROFESSIONAL DEVELOPMENT PROGRAM (LEVELS 1 AND 2) -- The student will be able to:

11.01 Assessment inventory.

11.01.01 Use an assessment inventory.
11.01.02 Establish short term goals.
11.01.03 Decide future career.
11.01.04 Survey employment opportunities
11.01.05 Define acronym for VICA.
11.01.06 Demonstrate knowledge of VICA.
11.01.07 Demonstrate knowledge of VICA motto.
11.01.08 Demonstrate knowledge of VICA colors.
11.01.09 Demonstrate knowledge of VICA creed.
11.01.10 Demonstrate knowledge of VICA dress.
11.01.11 Be knowledgeable of procedures in becoming a VICA officer.
11.01.12 Attend local VICA meeting.
11.01.13 Participate in VICA community project.
11.01.14 Demonstrate proficiency in program competency.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 8 COURSE NUMBER: 8757080

COURSE DESCRIPTION:

12.0 DEMONSTRATE KNOWLEDGE OF COSMETOLOGY PROFESSIONAL DEVELOPMENT PROGRAM (LEVELS 3 AND 4) -- The student will be able to:

12.01 Review short term goals.
12.02 Demonstrate VICA emblem.
12.03 Serve on a VICA committee.
12.04 Prepare a meeting agenda.
12.05 Demonstrate basic knowledge of Parliamentary Procedures.

12.06 Identify State legislators and governor.
12.07 Review a trade journal article.
12.08 Prepare a three to five minute speech.
12.09 Complete a job application.
12.10 Demonstrate knowledge of the purpose of VICA.
12.11 Participate in an opening and closing team ceremony.
12.12 Demonstrate knowledge of State VICA structure.
12.13 Plan a meeting or special program.
12.14 Plan and implement a program to promote VICA.
12.15 Take part in a job interview.
12.16 Demonstrate proficiency in program competency.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Cosmetology Specialist - Facials

CODE NUMBER: Secondary 8758100 Postsecondary I120423

Florida CIP 0612.040302

SECONDARY SCHOOL CREDITS 2 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 x 9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: COSMETOL @ 7 G PERS SERV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cosmetology specialists - facials. Instruction is designed to qualify students for employment upon successful completion of the program and obtaining a registration from the State Board of Cosmetology.

The content should include safe and efficient work practices, Florida cosmetology law and rules, acquisition of knowledge of cosmetology specialist - facials, and the related chemistry, bacteriology, anatomy and physiology; development of skills in performing the manipulative techniques required in the practice of cosmetology specialist - facials.

Listed below are the courses that comprise this program when offered at the secondary level:

8758110	Cosmetology Specialist - Facials 1
8758120	Cosmetology Specialist - Facials 2

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with chemicals, implements, and equipment appropriate to the program's content and in accordance with current practice in the trade.

III. SPECIAL NOTE: The outcomes and student performance standards which the handicapped student must master, must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The length of this program is 300 hours and minimum 40 services.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Employ proper laboratory practices.
02. Identify and perform facials, massage and makeup.
03. Demonstrate employability skills.
04. Demonstrate knowledge of the State Board of Cosmetology requirements for certification.
05. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8758100

PROGRAM TITLE: Cosmetology Specialist - Facials
POSTSECONDARY NUMBER: I120423

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, AND MAKE-UP--The student will be able to:

Facial Treatments

02.01 Prepare the patron.
02.02 Diagnose and identify skin condition.
02.03 Assemble supplies and equipment.
02.04 Cleanse face and neck.
02.05 Perform designated treatment (mechanical or manual).
02.06 Perform final cleansing of face and neck.
02.07 Perform eyebrow and lash treatment (tint/apply synthetic eyelashes).
02.08 Perform eyebrow tweezing and waxing.
02.09 Remove superfluous hair (using chemicals or wax).

Facial Make-up

02.10 Assemble supplies and equipment.
02.11 Prepare patron.
02.12 Diagnose and identify skin condition.
02.13 Apply base.
02.14 Apply eye make-up.
02.15 Apply rouge and lipstick.
02.16 Apply loose powder.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

04.0 DEMONSTRATE KNOWLEDGE OF THE STATE BOARD OF COSMETOLOGY REQUIREMENT FOR CERTIFICATION --The student will be able to:

04.01 Qualify for Florida's State Board Certification.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

05.01 Identify characteristics of the American enterprise system.
05.02 Define inflation and deflation.
05.03 Illustrate the basic economic questions facing any society.
05.04 Determine the results of a change in demand or a change in supply.
05.05 List factors which contribute to economic growth.
05.06 Identify characteristics of different types of business ownership.
05.07 Choose appropriate action in a situation requiring application of business ethics.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology Specialist -Facials

PROGRAM NUMBER: 8758100

COURSE TITLE: Cosmetology Specialist - Facials 1

COURSE NUMBER: 8758110

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom/laboratory procedures, It provides competencies in facials, massage.

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, AND MAKE-UP--The student will be able to:

Facial Treatments

02.01 Prepare the patron.
02.02 Diagnose and identify skin condition.
02.03 Assemble supplies and equipment.
02.04 Cleanse face and neck.
02.05 Perform designated treatment (mechanical or manual).
02.06 Perform final cleansing of face and neck.
02.07 Perform eyebrow and lash treatment (tint/apply synthetic eyelashes).
02.08 Perform eyebrow tweezing and waxing.
02.09 Remove superfluous hair (using chemicals or wax).

03.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology Specialist -Facials PROGRAM NUMBER: 8758100

COURSE TITLE: Cosmetology Specialist - Facials 2 COURSE NUMBER: 8758120

COURSE DESCRIPTION:

This course is designed to provide competencies in facial make-up and instruction in the selection of proper supplies and implements to perform this service.

02.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, AND MAKE-UP--The student will be able to:

Facial Make-Up

02.10 Assemble supplies and equipment.
02.11 Prepare the patron.
02.12 Diagnose and identify skin condition.
02.13 Apply base.
02.14 Apply eye make-up.
02.15 Apply rouge and lipstick.
02.16 Apply loose powder.

04.0 DEMONSTRATE KNOWLEDGE OF THE STATE BOARD OF COSMETOLOGY REQUIREMENTS FOR CERTIFICATION--The student will be able to:

04.01 Qualify for Florida's State Board Certification.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

05.01 Identify characteristics of the American enterprise system.
05.02 Define inflation and deflation.
05.03 Illustrate the basic economic questions facing any society.
05.04 Determine the results of a change in demand or a change in supply.
05.05 List factors which contribute to economic growth.
05.06 Identify characteristics of different types of business ownership.
05.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Cosmetology Specialist - Nails

CODE NUMBER: Secondary 8758000 Postsecondary 1120413

Florida CIP 0612.040301

SECONDARY SCHOOL CREDITS 1 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 x 9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: COSMETOL @ 7 G PERS SERV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a cosmetology specialist - nails, pedicurist and nail extensions. Instruction is designed to qualify students for employment upon successful completion of the program and obtaining a registration from the State Board of Cosmetology.

The content should include, safe and efficient work practices. Florida Cosmetology law and rules, acquisition of knowledge of cosmetology specialist-nails and the related chemistry, bacteriology, anatomy and physiology; development of skills in performing the manipulative techniques required in the practice of cosmetology specialist-nail.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with chemicals, implements, and equipment appropriate to the program's content and in accordance with current practices in the trade.

III. SPECIAL NOTE: The outcomes and student performance standards which the handicapped student must master, must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The length of this program is 150 hours and a minimum of 50 services.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Employ proper laboratory practices.
02. Identify and perform manicure, pedicure and nail extensions.
03. Demonstrate employability skills.
04. Demonstrate knowledge of the State Board of Cosmetology requirements for certification.
05. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8758000

PROGRAM TITLE: Cosmetology Specialist - Nails POSTSECONDARY NUMBER: I120413

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM MANICURE/PEDICURE/NAIL EXTENSIONS--The student will be able to:

02.01 Prepare the patron.
02.02 Assemble supplies and equipment.
02.03 Sanitize feet for pedicuring.
02.04 Remove polish, if any, and shape nails.
02.05 Soak in cuticle-cleansing and softening solution.
02.06 Apply cuticle solution.
02.07 Push and nip cuticles, if needed (do not use metal implements on feet).
02.08 Dip in cuticle-cleansing and softening solution; scrub.
02.09 Nip cuticles, if necessary (do not use metal implements on feet).
02.10 Apply cream or lotion: perform arm and hand massage.
02.11 Clean nails (separate toes with plastic footlets).
02.12 Apply nail tips or synthetic nails.
02.13 Apply base, polish; apply top coat or buff.

03. DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge or how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

04.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

04.01 Qualify for Florida's State Board Certification.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

05.01 Identify characteristics of the American enterprise system.
05.02 Define inflation and deflation.
05.03 Illustrate the basic economic questions facing any society.
05.04 Determine the results of a change in demand or a change in supply.
05.05 List factors which contribute to economic growth.
05.06 Identify characteristics of different types of business

ownership.

05.07 Choose appropriate action in a situation requiring application of business ethics.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology Specialist - Nails PROGRAM NUMBER: 8758000

COURSE TITLE: Cosmetology Specialist - Nails 1 COURSE NUMBER: 8758000

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom and laboratory procedures. It provides competencies in manicuring, pedicuring and nail extensions.

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM MANICURE/PEDICURE/NAIL EXTENSIONS--The student will be able to:

02.01 Prepare the patron.
02.02 Assemble supplies and equipment.
02.03 Sanitize feet for pedicuring.
02.04 Remove polish, if any, and shape nails.
02.05 Soak in cuticle-cleansing and softening solution.
02.06 Apply cuticle solution.
02.07 Push and nip cuticles, if needed (do not use metal implements on feet).
02.08 Dip in cuticle-cleansing and softening solution; scrub.
02.09 Nip cuticles, if necessary (do not use metal implements on feet).
02.10 Apply cream or lotion: perform arm and hand massage.
02.11 Clean nails (separate toes with plastic footlets).
02.12 Apply nail tips or synthetic nails.
02.13 Apply base, polish; apply top coat or buff.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge or how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

04.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

04.01 Qualify for Florida's State Board Certification.

05.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

05.01 Identify characteristics of the American enterprise system.
05.02 Define inflation and deflation.
05.03 Illustrate the basic economic questions facing any society.
05.04 Determine the results of a change in demand or a change in supply.
05.05 List factors which contribute to economic growth.
05.06 Identify characteristics of different types of business ownership.
05.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Culinary Management

CODE NUMBER: Secondary ___________ Postsecondary _______

Florida CIP 0620.040100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS _x_ POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

_x_Postsecondary Vocational ___Other_____________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment in commercial and institutional management positions leading to: Executive Chef, Stewart, Food and Beverage Director, Restaurant Manager, or Caterer. This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include, but not be limited to the following: Supervision and personnel management, Culinary Organization, Culinary Terminology and Communications, Human Relations, Personnel Training, Sanitation and Safety, Food and Beverage Purchasing, Cost Control, Menu Design, Merchandising, dining Room Management, Human Nutrition, Food Production, Regional and International Cuisines, Classical Cuisine, Basic Baking, Advanced Pastry and Deserts, Garde Manager, and Beverage Management.

The course content should also include training in communications, leadership, human relations, employability skills and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Laboratory activities and volume production are an integral part of this program. The student will gain the competence required to manage each station under the pressure of commercial business. These activities equip students to produce rapidly, utilizing the hand tools, equipment, food materials, practices, processes, and management techniques found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. The American Culinary Federation is the professional organization which will introduce the student to their professional organization and industry certification. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for part of this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Identify the organization and functions of the Culinary Industry.
02. Demonstrate acceptable professional and personal sanitation practices.
03. Demonstrate safe working practices.
04. Demonstrate equipment operation skills.
05. Demonstrate the application of mathematics as it applies to the production of products and the business of the Culinary Industry.
06. Demonstrate effective purchasing and cost control.
07. Prepare, direct and manage the production of salads.
08. Prepare, direct and manage the production of beverages.
09. Prepare, direct and manage the production of sandwiches.
10. Prepare, direct and manage the production fruits and vegetables.
11. Prepare, direct and manage the production of meats, poultry, and seafood.
12. Prepare, direct and manage the production of stocks, soups, and sauces/gravies.
13. Prepare, direct and manage the production of foods utilizing dairy products.
14. Prepare, direct and manage the production of foods utilizing egg products.
15. Prepare, direct and manage the production of foods utilizing farinaceous (starchy) products.
16. Prepare, direct and manage the production of pastries and advanced desserts.
17. Prepare, direct and manage the production of basic quick breads and yeast dough.
18. Demonstrate an understanding of the composition of foods, and the processes used for preparation.
19. Demonstrate skill in applying principles of nutrition.
20. Demonstrate skill in utilizing wines and spirits in production and in dining service.
21. Demonstrate proficiency in menu preparation.
22. Demonstrate proficiency in the management of dining room operations.
23. Demonstrate a proficiency in the management of customer relations.
24. Demonstrate appropriate communication skills.
25. Demonstrate employability skills.
26. Demonstrate an understanding of entrepreneurship.
27. Demonstrate the human relations skills necessary for success in marketing culinary management occupations.
28. Apply sales promotion techniques and procedures to the management of food services.
29. Demonstrate a knowledge of basic economic principles.
30. Understand the importance of management.
31. Deal with legal issues.
32. Comply with governmental regulations.
33. Manage human resources.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education	SECONDARY NUMBER:

PROGRAM TITLE: Culinary Management	POSTSECONDARY NUMBER:

01.0 IDENTIFY THE ORGANIZATION AND FUNCTIONS OF THE CULINARY INDUSTRY.

01.01 Identify the Culinary Brigade.
01.02 Identify classic repertoire.
01.03 Identify modern kitchen organization.
01.04 Identify station and job descriptions.
01.05 Identify culinary terms.
01.06 Identify career progression in culinary arts.
01.07 Trace growth and development of food and beverage industry.
01.08 Discuss history and composition of foods and beverages.
01.09 Discuss trends in food and beverage industry.

02.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

02.01 Chemical/Cleaning Agents

02.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
02.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
02.01.03 Identify and practice personnel handling precautions for caustics and acids.
02.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

02.02 Food Borne Illness

02.02.01 Identify food borne illness and possible/probable causes.
02.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

02.03 Personal Sanitation

02.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

02.04 Receiving/Dry Stores Area

02.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
02.04.02 Clean and sanitize floors and walls.
02.04.03 Recognize and report indications of food spoilage.
02.04.04 Recognize and report indications of insect or rodent infestation.

02.05 Food Preparation Areas

02.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
02.05.02 Clean and sanitize floors and walls.
02.05.03 Recognize and report indications of insect or rodent

infestation.

02.06 Range Hoods

02.06.01 De-grease and clean range hoods.
02.06.02 Remove, clean, and replace filters.

02.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

02.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
02.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
02.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
02.07.04 Recognize and report indications of food spoilage.

02.08 Food holding/Serving lines

02.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
02.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
02.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
02.08.04 Recognize and report indications of food spoilage.

02.09 Dishware/Tableware

02.09.01 Properly prepare dish washing area for use.
02.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
02.09.03 Properly clean, sanitize, and secure dish washing area.

02.10 Pots, Pans, and Cook Utensils

02.10.01 Properly prepare deep-sink area for use.
02.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
02.10.03 Properly clean, sanitize, and secure deep-sink area.

02.11 Guest/Customer Areas

02.11.01 Properly clean and sanitize counter areas.
02.11.02 Properly clean and sanitize dining areas.
02.11.03 Properly clean and sanitize restrooms.

03.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

03.01 Safety Hazards

03.01.01 Identify physical safety rules.
03.01.02 Identify physical safety hazards.
03.01.03 Recognize and correct or report physical safety hazards.
03.01.04 Identify electrical safety rules.
03.01.05 Identify electrical safety hazards.
03.01.06 Recognize and correct or report electrical safety hazards.

03.01.07 Identify fire safety rules.
03.01.08 Identify fire safety hazards.
03.01.09 Recognize and correct or report fire safety hazards.

03.02 First Aid

03.02.01 Identify First Aid requirements for a commercial food service operation.
03.02.02 Prepare subject and perform Heimlich maneuver.

04.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

04.01 Hand Tools

04.01.01 Identify special precautions to be used when working with hand tools.
04.01.02 Select and use hand tools in a safe and efficient manner.

04.02 Beverage Equipment

04.02.01 Identify special precautions to be used when working with beverage equipment.
04.02.02 Correctly assemble and disassemble beverage equipment.
04.02.03 Operate beverage equipment in a safe and efficient manner.

04.03 Pressure Cookers and Steam Equipment

04.03.01 Identify special precautions to be used when working with steam under pressure.
04.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
04.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

04.04 Grinders and Tenderizers

04.04.01 Identify special precautions to be used when working with grinders and tenderizers.
04.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
04.04.03 Operate grinders and tenderizers in a safe and efficient manner.

04.05 Knives and Cutting Tools

04.05.01 Identify special precautions to be used when working with knives and cutting tools.
04.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
04.05.03 Use knives and cutting tools in a safe and efficient manner.

04.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

04.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
04.06.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

04.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

04.07 Proofers

04.07.01 Identify special precautions to be used when working with proofers.
04.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
04.07.03 Operate proofers in a safe and efficient manner.

04.08 Mixers and Blenders

04.08.01 Identify special precautions to be used when working with mixers and blenders.
04.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
04.08.03 Operate mixers and blenders in a safe and efficient manner.
04.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

04.09 Slicing Machines

04.09.01 Identify special precautions to be sued when working with slicing machines.
04.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)
04.09.03 Operate slicing machines in a safe and efficient manner.

04.10 Food Warmers

04.10.01 Identify special precautions to be used when working with food warmers.
04.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
04.10.03 Operate food warmers in a safe and efficient manner.

05.0 DEMONSTRATE THE APPLICATION OF MATHEMATICS AS IT APPLIES TO THE PRODUCTION OF PRODUCTS AND THE BUSINESS OF THE CULINARY INDUSTRY.

05.01 Demonstrate proficiency in basic math skills.

05.01.01 Demonstrate proficiency in the addition of whole numbers, fractions, and decimals.
05.01.02 Demonstrate proficiency in the subtraction of whole numbers, fractions, and decimals.
05.01.03 Demonstrate proficiency in the multiplication of whole numbers, fractions, and decimals.
05.01.04 Demonstrate proficiency in the division of whole numbers, fractions, and decimals.

05.02 Demonstrate knowledge of measures and conversions.

05.02.01 Demonstrate knowledge of weight units and their conversion.
05.02.02 Demonstrate knowledge of volume units and their

conversion.

05.03 Demonstrate knowledge of recipe conversions.

05.03.01 Convert recipes for greater or lesser number of servings.

05.04 Demonstrate effective cost estimation.

05.04.01 Estimate material cost per serving.
05.04.02 Estimate preparation cost (less materials).
05.04.03 Cost out menu given profit margin.

05.05 Identify the break-even point for merchandising.
05.06 Perform mathematical operations unique to culinary management.

06.0 DEMONSTRATE EFFECTIVE PURCHASING AND COST CONTROL.--The student will be able to:

06.01 Inventory Control

06.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.
06.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.
06.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.
06.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

06.02 Weights and Measures

06.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
06.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
06.02.03 Convert recipes for both a greater and lesser number of portions.

06.03 Portion Control

06.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)
06.03.02 Identify and apply portion control methods.

06.04 Purchasing Techniques

06.04.01 Write purchasing specifications.
06.04.02 Identify purchasing methods such as: direct buying; contract buying and bidding.

07.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF SALADS.--The student will be able to:

07.01 Identify and select materials for salad preparation.

07.02 Prepare salads.
07.03 Hold salads for service.
07.04 Garnish and present salads.
07.05 Store reusable portions.
07.06 Prepare salad dressings, cold sauces, and derivatives.
07.07 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

08.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF BEVERAGES.--The student will be able to:

08.01 Identify and select materials for beverage preparation.
08.02 Prepare hot and cold beverages.
08.03 Hold beverages for serving.
08.04 Garnish and present beverages.
08.05 Store reusable portions.
08.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

09.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF SANDWICHES.--The student will be able to:

09.01 Identify and select materials for sandwich preparation.
09.02 Prepare hot and cold sandwiches.
09.03 Hold sandwiches for serving.
09.04 Garnish and present sandwiches.
09.05 Store reusable portions.
09.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

10.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF FRUITS AND VEGETABLES.--The student will be able to:

10.01 Identify and select fruits and vegetables.
10.02 Prepare fruits and vegetables.
10.03 Hold fruits and vegetables for serving.
10.04 Garnish and present fruits and vegetables.
10.05 Store reusable portions.
10.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

11.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF MEATS, POULTRY AND SEAFOOD.--The student will be able to:

11.01 Identify and select meats.

11.01.01 Identify meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
11.01.02 Prepare meats with given recipes.
11.01.03 Hold meats for serving.
11.01.04 Garnish and present meats.
11.01.05 Store reusable portions.
11.01.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

11.02 Identify and select poultry.

11.02.01 Identify poultry characteristics, proper cooking and done temperatures, traditional side dishes and

condiments, possible parasites, and potential micro-organism growth.
11.02.02 Prepare poultry with given recipes.
11.02.03 Hold poultry for serving.
11.02.04 Garnish and present poultry.
11.02.05 Store reusable portions.
11.02.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

11.03 Identify and select seafood.

11.03.01 Identify seafood characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
11.03.02 Prepare seafood with given recipes.
11.03.03 Hold seafood for serving.
11.03.04 Garnish and present seafood.
11.03.05 Store reusable portions.
11.03.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

12.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF STOCKS, SOUPS, AND SAUCES/GRAVIES.--The student will be able to:

12.01 Stocks

12.01.01 Identify and select ingredients.
12.01.02 Prepare basic stocks.
12.01.03 Store stock for future use.
12.01.04 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

12.02 Soups

12.02.01 Identify and select ingredients.
12.02.02 Prepare soups.
12.02.03 Hold soups for service.
12.02.04 Garnish and present soups
12.02.05 Store leftover portions for future use.
12.02.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

12.03 Sauces and Gravies

12.03.01 Identify and select ingredients.
12.03.02 Prepare sauces and gravies.
12.03.03 Hold sauces and gravies for service.
12.03.04 Store left over sauces and gravies for future use.
12.03.07 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

13.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF FOODS UTILIZING DAIRY PRODUCTS.--The student will be able to:

13.01 Identify and select dairy products.

13.02 Prepare foods utilizing dairy products using given recipes.
13.03 Hold food containing dairy products for service.
13.04 Garnish and present foods containing dairy products.
13.05 Store reusable portions.
13.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

14.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF FOODS UTILIZING EGG PRODUCTS.--The student will be able to:

14.01 Identify and select egg products.
14.02 Prepare foods utilizing egg products using given recipes.
14.03 Hold food containing egg products for service.
14.04 Garnish and present foods containing egg products.
14.05 Store reusable portions.
14.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

15.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF FOODS UTILIZING FARINACEOUS (STARCHY) PRODUCTS.--The student will be able to:

15.01 Identify and select farinaceous products.
15.02 Prepare foods utilizing farinaceous products using given recipes.
15.03 Hold food containing farinaceous products for service.
15.04 Garnish and present foods containing farinaceous products.
15.05 Store reusable portions.
15.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

16.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF PASTRIES AND ADVANCED DESSERTS.--The student will be able to:

16.01 Identify and select ingredients.
16.02 Prepare basic products.
16.03 Hold products for service.
16.04 Garnish and present products.
16.05 Store reusable portions.
16.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

17.0 PREPARE, DIRECT AND MANAGE THE PRODUCTION OF BASIC QUICK BREADS AND YEAST DOUGH.--The student will be able to:

17.01 Quick Breads

17.01.01 Identify and select quick bread ingredients.
17.01.02 Prepare quick breads using given recipes.
17.01.03 Hold quick breads for service.
17.01.04 Present quick breads.
17.01.05 Store reusable portions.
17.01.06 Utilize principles of inventory control, cost control, portion control, management, human relations, and training skills.

17.02 Yeast dough

17.02.01 Identify and select yeast dough ingredients.
17.02.02 Prepare yeast dough products using given recipes.
17.02.03 Hold yeast dough products for service.
17.02.04 Present yeast dough products.
17.02.05 Store reusable portions.
17.02.06 Utilize principles of inventory control, cost control,

portion control, management, human relations, and training skills.

18.0 DEMONSTRATE AN UNDERSTANDING OF THE COMPOSITION OF FOODS, AND THE PROCESSES USED FOR PREPARATION.

18.01 Identify the composition of foods.

18.01.01 Identify the composition of meats.
18.02.02 Identify the composition of fruits, vegetables, and starches.

18.02 Identify cooking methods and demonstrate a knowledge of:

18.02.01 Liquid retention.
18.02.02 Vitamin and mineral retention.
18.02.03 Retention of color and composition.

19.0 DEMONSTRATE SKILL IN APPLYING PRINCIPLES OF NUTRITION.

19.01 Identify food groups.
19.02 Define dietary allowances of:

19.02.01 Proteins
19.02.02 Fats
19.02.03 Carbohydrates
19.02.04 Vitamins/minerals

19.03 Define exchange groups.

20.0 DEMONSTRATE SKILL IN UTILIZING WINES AND SPIRITS IN PRODUCTION AND IN DINING SERVICE.

20.01 Demonstrate knowledge of history of wine and spirits.
20.02 Demonstrate an understanding and effectively use wine and spirit terms.
20.03 Properly present and serve wines and spirits.
20.04 Prepare and direct production of foods utilizing wines and spirits.

21.0 DEMONSTRATE PROFICIENCY IN MENU PREPARATION.--The student will be able to:

21.01 Prepare menu considering:

21.01.01 Eating trends
21.01.02 Nutritional requirements
21.01.03 Cost
21.01.04 Limiting factors of facilities and/or personnel
21.01.05 Seasonal or traditional eating habits (holidays, ethnic, regional)
21.01.06 Seasonal foods
21.01.07 Apply basic techniques of merchandising food and beverage

22.0 DEMONSTRATE PROFICIENCY IN THE MANAGEMENT OF DINING ROOM OPERATIONS.--The student will be able to:

22.01 Prepare and maintain dining room for service.
22.02 Greet and escort customers.

22.03 Customer Service.

22.03.01 Present menu/menus
22.03.02 Sell and merchandise menu items.
22.03.03 Take orders.
22.03.04 Serve food.
22.03.05 Calculate and present guest check.

22.04 Handling money.

22.04.01 Demonstrate responsible cash handling.
22.04.02 Demonstrate ability to calculate and county customers change.
22.05 Utilize the principles of management, human relations and training skills.

23.0 DEMONSTRATE A PROFICIENCY IN THE MANAGEMENT OF CUSTOMER RELATIONS.--The student will be able to:

23.01 Resolve customer complaints in a positive professional manner.
23.02 Cope with stressful situations.
23.03 Accommodate the needs of customers (handicapped, infants, elderly.)
23.04 Maintain a positive friendly dining room attitude.
23.05 Display team work.
23.06 Present a neat and clean appearance that will promote a positive image of the establishment.
23.07 Utilize the principles of management and human relations.

24.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

24.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
24.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
24.03 Read and follow written and oral instructions.
24.04 Answer and ask questions coherently and concisely.
24.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
24.06 Demonstrate appropriate telephone/communication skills.
24.07 Demonstrate the components of the communication process.

25.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

25.01 Conduct a job search.
25.02 Secure information about a job.
25.03 Identify documents which may be required when applying for a job.
25.04 Complete a job application form correctly.
25.05 Demonstrate competence in job interview techniques.
25.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
25.07 Identify acceptable work habits.
25.08 Demonstrate a knowledge of how to make job changes appropriately.
25.09 Demonstrate acceptable employee health habits.
25.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

26.0 DEMONSTRATE THE ROLE OF THE MANAGER AND THE ENTREPRENEUR--The student will be able to:

26.01 Define entrepreneurship.
26.02 Describe the importance of entrepreneurship to the American economy.
26.03 List the advantages and disadvantages of business ownership.
26.04 Identify the risks involved in ownership of a business.
26.05 Identify the necessary personal characteristics of a successful entrepreneur.
26.06 Identify the business skills needed to operate a small business efficiently and effectively.
26.07 Consider the personal qualifications and abilities needed to manage and/or own a business.
26.08 Evaluate your own potential for decision making, problem solving, and creativity.
26.09 Determine your potential for management, planning, operations, personnel, and public relations.

27.0 DEMONSTRATE THE HUMAN RELATIONS SKILLS NECESSARY FOR SUCCESS IN MARKETING CULINARY MANAGEMENT OCCUPATIONS.--The student will be able to:

27.01 Exhibit acceptable grooming habits.
27.02 Exhibit punctuality, initiative, courtesy, loyalty, and honesty.
27.03 Exhibit the ability to get along with others.
27.04 Build a framework of steps necessary to successfully plan one's professional future.

28.0 APPLY SALES PROMOTION TECHNIQUES AND PROCEDURES TO THE MANAGEMENT OF FOOD SERVICES--The student will be able to:

28.01 Explain the benefits of publicity and public relations.
28.02 Use the telephone as effective sales promotion instrument.
28.03 Implement the services of advertising agencies.
28.04 Utilize various advertising media effectively.

29.0 DEMONSTRATE A KNOWLEDGE OF BASIC ECONOMIC PRINCIPLES--The student will be able to:

29.01 Identify basic economic concepts.
29.02 Apply basic economic principles.

30.0 UNDERSTAND THE IMPORTANCE OF MANAGEMENT--The student will be able to:

30.01 Identify basic management concepts.
30.02 Discuss overall management strategies.
30.03 Relate management techniques to the culinary industry.

31.0 DEAL WITH LEGAL ISSUES--The student will be able to:

31.01 Discuss legal rights of customers.
31.02 Discuss applicable wage and hour laws.
31.03 Discuss laws affecting hiring practices.
31.04 Discuss public health and safety laws.
31.05 Discuss license and beverage regulations.
31.06 Discuss warranties and product liabilities.
31.07 Discuss tax laws.
31.08 Discuss banquet contracts.

32.0 COMPLY WITH GOVERNMENTAL REGULATIONS--The student will be able to:

32.01 Identify areas of government regulation that should be considered by the food service industry.
32.02 Compile a list of appropriate governmental agencies concerned with regulations, licenses, and permits.

33.0 **MANAGE HUMAN RESOURCES**--The student will be able to:

33.01 Identify the steps involved in hiring employees.
33.02 Describe the procedures for developing a training program.
33.03 Describe various techniques that may be used to supervise and motivate employees.
33.04 Describe various methods for communicating with employees.
33.05 Discuss various alternatives for evaluating employee performance
33.06 Identify the steps in developing a comprehensive employee compensation package.
33.07 Demonstrate the ability to create personnel schedules.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Diesel Engine Mechanics

CODE NUMBER: Secondary 8742000 Postsecondary _______

Florida CIP 0647.060500

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DESEL MECH @ 7 G

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as bus and truck diesel engine mechanics (8531163[illegible]) and diesel mechanics helpers (625.684-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: maintaining and repairing diesel engines and electrical systems; reconditioning diesel fuel injection systems; overhauling diesel engines; and performing diesel engine preventive maintenance.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level.

8742010	Diesel Engine Mechanics 1
8742020	Diesel Engine Mechanics 2
8742030	Diesel Engine Mechanics 3
8742040	Diesel Engine Mechanics 4
8742050	Diesel Engine Mechanics 5
8742060	Diesel Engine Mechanics 6

II. **LABORATORY ACTIVITIES:** Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. **SPECIAL NOTE:** The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing diesel trade skills.
02. Demonstrate proficiency in applying electrical principles.
03. Demonstrate proficiency in applying electronic principles.
04. Demonstrate proficiency in maintaining and repairing diesel engines.
05. Demonstrate proficiency in maintaining and repairing electrical systems.
06. Demonstrate proficiency in reconditioning diesel fuel injection systems.
07. Demonstrate proficiency in reconditioning diesel engine components.
08. Demonstrate proficiency in overhauling diesel engines (two-stroke and four-stroke cycle engines).
09. Demonstrate proficiency in performing diesel engine preventive maintenance (PM).
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: 8742000

PROGRAM TITLE: Diesel Engine Mechanics — POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS --The student will be able to:

01.01 Follow safety practices.
01.02 Apply basic math skills.
01.03 Apply intermediate math skills.
01.04 Recognize, identify and make metric conversions.
01.05 Perform basic welding skills.
01.06 Use hand tools.
01.07 Use power tools.
01.08 Use measuring and precision tools.
01.09 Identify types of bearings and seals.
01.10 Identify power train components and functions.
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.12 Read and use parts manuals.
01.13 Read, interpret and apply service manuals.

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES--The student will be able to:

02.01 Identify the nature of electricity.
02.02 Analyze electrical circuits.
02.03 Define Ohm's and Kirchoff's laws.
02.04 Identify magnetism and electromagnetic induction.
02.05 Identify applications of alternating current.
02.06 Identify principles of direct-current (DC) motors and generators.
02.07 Identify principles of alternating-current (AC) motors.
02.08 Locate and match electrical units by their symbols on a wiring diagram.
02.09 Setup and use voltmeters, ammeters and ohmmeters.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES--The student will be able to:

03.01 Identify principles of diodes and rectifiers.
03.02 Identify principles of voltage regulation and power supply circuits.
03.03 Identify principles of transistors.
03.04 Identify principles of the silicon controlled rectifier (SCR).
03.05 Identify components of electronic systems and their functions.

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES--The student will be able to:

04.01 Identify diesel engine operating principles (two- and four-stroke cycle engines).
04.02 Identify components of two- and four-stroke cycle engines.
04.03 Troubleshoot and repair cooling systems.
04.04 Troubleshoot and repair lubrication systems.
04.05 Troubleshoot and repair induction and exhaust systems.

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS--The student will be able to:

05.01 Test and service batteries.
05.02 Test and repair starting systems.
05.03 Test and repair DC charging systems.
05.04 Test and repair AC charging systems.
05.05 Test and repair ignition systems.
05.06 Test and repair lighting and accessories systems.
05.07 Test and service instruments and gauges.

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS--The student will be able to:

06.01 Identify fuel injection systems principles and components.
06.02 Troubleshoot fuel injection systems and components.
06.03 Remove, replace and adjust fuel injection systems and components.
06.04 Identify governor types and operating principles.
06.05 Troubleshoot governors.
06.06 Remove, repair or replace and adjust governors.

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS--The student will be able to:

07.01 Explain the basic principles of the operation of the two- and four-stroke cycle diesel engine.
07.02 Identify engine assemblies and systems.
07.03 Diagnose valve and head problems by use of the visual inspection method.
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method.
07.05 Diagnose valve and head problems by use of the stethoscope method.
07.06 Disassemble engines.
07.07 Clean and inspect heads for cracks, warpage and injector sleeves.
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear and valve seat.
07.09 Grind valve seats and reface valves.
07.10 Check and inspect springs for free height, distortion and installed height.
07.11 Adjust valve lash.
07.12 Remove and inspect camshaft bearings and lifters.
07.13 Time valve drive assemblies.
07.14 Remove pistons from rod assemblies.
07.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer.
07.16 Check piston pins and boss for wear.
07.17 Measure piston ring lands width, out-of-round and taper.
07.18 Measure the piston ring gap in a cylinder bore.
07.19 Install and fit piston pins.
07.20 Check rod and piston assembly alignment.
07.21 Remove and replace rod bearings.
07.22 Hone and clean cylinders.
07.23 Install rings on pistons.
07.24 Measure and check crankshafts with a micrometer.
07.25 Check the bearing bore with a telescoping gauge.
07.26 Reassemble engines using a plastic gauge.
07.27 Install oil seals.
07.28 Check for end play.

08.0 DEMONSTRATE PROFICIENCY IN OVERHAULING DIESEL ENGINES (TWO-STROKE AND FOUR-STROKE CYCLE ENGINES)--The student will be able to:

08.01 Troubleshoot and diagnose engine problems.
08.02 Remove and install electrical equipment.
08.03 Recondition turbochargers, blowers and superchargers.

08.04 Recondition cooling systems.
08.05 Recondition intake and exhaust manifolds.
08.06 Recondition fans, vibrator dampers and front pulleys.
08.07 Recondition air compressors.
08.08 Recondition flywheels.
08.09 Recondition flywheel housings.
08.10 Recondition lubrication systems.
08.11 Recondition front covers.
08.12 Remove and install fuel systems.
08.13 Recondition cylinder heads.
08.14 Recondition cylinder sleeves and pistons.
08.15 Recondition camshafts and accessory drives.
08.16 Recondition crankshafts.
08.17 Recondition cylinder blocks.
08.18 Perform dynamometer tests.

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL ENGINE PREVENTIVE MAINTENANCE (PM)--The student will be able to:

09.01 Perform PM inspection "A"
09.02 Perform PM inspection "B"
09.03 Perform PM inspection "C"

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Diesel Engine Mechanics	PROGRAM NUMBER:	8742000
COURSE TITLE:	Diesel Engine Mechanics 1	COURSE NUMBER:	8742010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing diesel trade skills and to enable the student to gain employability skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS--The student will be able to:

01.01 Follow safety practices.
01.02 Apply basic math skills.
01.03 Apply intermediate math skills.
01.04 Recognize, identify and make metric conversions.
01.05 Perform basic welding skills.
01.06 Use hand tools.
01.07 Use power tools.
01.08 Use measuring and precision tools.
01.09 Identify types of bearings and seals.
01.10 Identify power train components and functions.
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.12 Read and use parts manuals.
01.13 Read, interpret and apply service manuals.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify for demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Diesel Engine Mechanics	PROGRAM NUMBER:	8742000
COURSE TITLE:	Diesel Engine Mechanics 2	COURSE NUMBER:	8742020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for applying electrical and electronic principles.

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES--The student will be able to:

02.01 Identify the nature of electricity.
02.02 Analyze electrical circuits.
02.03 Define Ohm's and Kirchoff's laws.
02.04 Identify magnetism and electromagnetic induction.
02.05 Identify applications of alternating current.
02.06 Identify principles of direct-current (DC) motors and generators.
02.07 Identify principles of alternating-current (AC) motors.
02.08 Locate and match electrical units by their symbols on a wiring diagram.
02.09 Setup and use voltmeters, ammeters and ohmmeters.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES--The student will be able to:

03.01 Identify principles of diodes and rectifiers.
03.02 Identify principles of voltage regulation and power supply circuits.
03.03 Identify principles of transistors.
03.04 Identify principles of the silicon controlled rectifier (SCR).
03.05 Identify components of electronic systems and their functions.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 3 COURSE NUMBER: 8742030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for the maintenance and repair of diesel engines and electrical systems.

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES--The student will be able to:

04.01 Identify diesel engine operating principles (two- and four-stroke cycle engines).
04.02 Identify components of two- and four-stroke cycle engines.
04.03 Troubleshoot and repair cooling systems.
04.04 Troubleshoot and repair lubrication systems.
04.05 Troubleshoot and repair induction and exhaust systems.

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS--The student will be able to:

05.01 Test and service batteries.
05.02 Test and repair starting systems.
05.03 Test and repair DC charging systems.
05.04 Test and repair AC charging systems.
05.05 Test and repair ignition systems.
05.06 Test and repair lighting and accessories systems.

05.07 Test and service instruments and gauges.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 4 COURSE NUMBER: 8742040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reconditioning diesel fuel injection systems.

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS--The student will be able to:

06.01 Identify fuel injection systems principles and components.
06.02 Troubleshoot fuel injection systems and components.
06.03 Remove, replace and adjust fuel injection systems and components.
06.04 Identify governor types and operating principles.
06.05 Troubleshoot governors.
06.06 Remove, repair or replace and adjust governors.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 5 COURSE NUMBER: 8742050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reconditioning diesel engine components.

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS--The student will be able to:

07.01 Explain the basic principles of the operation of the two-and four-stroke cycle diesel engine.
07.02 Identify engine assemblies and systems.
07.03 Diagnose valve and head problems by use of the visual inspection method.
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method.
07.05 Diagnose valve and head problems by use of the stethoscope method.
07.06 Disassemble engines.
07.07 Clean and inspect heads for cracks, warpage and injector sleeves.
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear and valve seat.
07.09 Grind valve seats and reface valves.
07.10 Check and inspect springs for free height, distortion and installed height.

07.11 Adjust valve lash.
07.12 Remove and inspect camshaft bearings and lifters.
07.13 Time valve drive assemblies.
07.14 Remove pistons from rod assemblies.
07.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer.
07.16 Check piston pins and boss for wear.
07.17 Measure piston ring lands width, out-of-round and taper.
07.18 Measure the piston ring gap in a cylinder bore.
07.19 Install and fit piston pins.
07.20 Check rod and piston assembly alignment.
07.21 Remove and replace rod bearings.
07.22 Hone and clean cylinders.
07.23 Install rings on pistons.
07.24 Measure and check crankshafts with a micrometer.
07.25 Check the bearing bore with a telescoping gauge.
07.26 Reassemble engines using a plastic gauge.
07.27 Install oil seals.
07.28 Check for end play.

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STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics　　PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 6　　COURSE NUMBER: 8742060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for overhauling diesel engines and performing diesel engine preventive maintenance.

08.0 DEMONSTRATE PROFICIENCY IN OVERHAULING DIESEL ENGINES (TWO-STROKE AND FOUR-STROKE CYCLE ENGINES)--The student will be able to:

08.01 Troubleshoot and diagnose engine problems.
08.02 Remove and install electrical equipment.
08.03 Recondition turbochargers, blowers and superchargers.
08.04 Recondition cooling systems.
08.05 Recondition intake and exhaust manifolds.
08.06 Recondition fans, vibrator dampers and front pulleys.
08.07 Recondition air compressors.
08.08 Recondition flywheels
08.09 Recondition flywheel housings.
08.10 Recondition lubrication systems.
08.11 Recondition front covers.
08.12 Remove and install fuel systems.
08.13 Recondition cylinder heads.
08.14 Recondition cylinder sleeves and pistons.
08.15 Recondition camshafts and accessory drives.
08.16 Recondition crankshafts.
08.17 Recondition cylinder blocks.
08.18 Perform dynamometer tests.

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL ENGINE PREVENTIVE MAINTENANCE (PM)--The student will be able to:

09.01 Perform PM inspection "A"
09.02 Perform PM inspection "B"
09.03 Perform PM inspection "C"

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business kills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Drafting

CODE NUMBER: Secondary 8724000 Postsecondary I480101

Florida CIP 0648.010100

SECONDARY
SCHOOL CREDITS 4 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONST @7 G DRAFTING @7 G
¶BLD CONST @7 G TEC DFT @7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafting assistants (017.281-018) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, reprographic machine operation, use of drafting tools and equipment, drafting skills, charts and graphs, computer aided drawings, and technical mathematics.

Listed below are the courses that comprise this program when offered at the secondary level:

8724010	Drafting Skills 1
8724020	Drafting Skills 2
8724030	Drafting Skills 3
8724040	Drafting Skills 4

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, drafting tools, CAD systems, reprographic machine materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This program is part of the Drafting core program and is a prerequisite for Advanced Drafting and all postsecondary adult vocational drafting programs.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 600 hours. Approximately 250 hours shall be spent utilizing CAD systems.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.
06. Prepare auxiliary drawings.
07. Apply basic dimensioning.
08. Prepare pictorial drawings.
09. Prepare surface developments.
10. Prepare basic architectural drawings.
11. Prepare basic civil drawings.
12. Demonstrate basic electrical/electronic literacy.
13. Prepare basic computer aided drawings.
14. Demonstrate appropriate communication skills.
15. Demonstrate applied math skills.
16. Demonstrate basic science as applied to drafting.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial

PROGRAM TITLE: Drafting

EFFECTIVE DATE: July, 1993

SECONDARY NUMBER: 8724000

POSTSECONDARY NUMBER: I480101

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Identify and use the various drafting media and techniques (cut and paste, overlay, inking, sepia).
02.03 Use conversion tables for fractions, decimals and metric measurements.
02.04 Demonstrate the use of the alphabet of lines.
02.05 Prepare title blocks and other drafting formats.
02.06 Use various freehand and other lettering techniques.
02.07 Prepare axonometric, oblique and perspective sketches.
02.08 Prepare charts, graphs, and diagrams.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve right-angle trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Prepare a sectional assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.

06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear, angular, and circular standard dimensions.
07.02 Prepare drawings using metric dimensions.
07.03 Prepare drawings using general and local notes.
07.04 Apply basic tolerancing techniques.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric and other pictorial drawings.
08.02 Prepare one-and two-point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with stretchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare stretchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

10.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to:

10.01 Prepare site plan.
10.02 Prepare floor plan.
10.03 Prepare exterior elevations.
10.04 Prepare typical wall section.
10.05 Prepare roof plan.

11.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

11.01 Understand civil terminology.
11.02 Read and interpret civil drawings.
11.03 Prepare plan and profile drawings.
11.04 Prepare highway drawings.
11.05 Develop topographic drawings.

12.0 DEMONSTRATE ELECTRICAL/ELECTRONIC LITERACY

12.01 Understand electrical/electronic terminology.
12.02 Identify electrical/electronic symbols.
12.03 Prepare schematic/block diagrams.

13.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

13.01 Develop hardware/software skills.
13.02 Identify and understand CAD functions.
13.03 Prepare CAD drawings.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read written and follow oral instructions.
14.03 Answer and ask questions coherently and concisely.
14.04 Read critically by recognizing assumptions and implications and by evaluating ideas.

14.05 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPLIED MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE BASIC SCIENCE AS APPLIED TO DRAFTING -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Drafting
PROGRAM NUMBER: 8724000

COURSE TITLE: Drafting Skills 1
COURSE NUMBER: 8724010

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Identify and use the various drafting media and techniques (cut and paste, overlay, inking, sepia).
02.03 Use conversion tables for fractions, decimals and metric measurements.
02.04 Demonstrate the use of the alphabet of lines.
02.05 Prepare title blocks and other drafting formats.
02.06 Use various freehand and other lettering techniques.
02.07 Prepare axonometric, oblique and perspective sketches.
02.08 Prepare charts, graphs, and diagrams.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve right-angle trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Prepare a sectional assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Drafting	PROGRAM NUMBER: 8724000
COURSE TITLE: Drafting Skills 2	COURSE NUMBER: 8724020

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear, angular, and circular standard dimensions.
07.02 Prepare drawings using metric dimensions.
07.03 Prepare drawings using general and local notes
07.04 Apply basic tolerancing techniques.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric and other pictorial drawings.
08.02 Prepare one-and two-point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with stretchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare stretchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

10.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to:

10.01 Prepare site plan.
10.02 Prepare floor plan.
10.03 Prepare exterior elevations.
10.04 Prepare typical wall section.
10.05 Prepare roof plan.

11.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

11.01 Understand civil terminology.
11.02 Read and interpret civil drawings.
11.03 Prepare plan and profile drawings.
11.04 Prepare highway drawings.
11.05 Develop topographic drawings.

12.0 DEMONSTRATE ELECTRICAL/ELECTRONIC LITERACY

12.01 Understand electrical/electronic terminology.
12.02 Identify electrical/electronic symbols.
12.03 Prepare schematic/block diagrams.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Drafting — PROGRAM NUMBER: 8724000

COURSE TITLE: Drafting Skills 3 — COURSE NUMBER: 8724030

13.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

13.01 Develop hardware/software skills.
13.02 Identify and understand CAD functions.
13.03 Prepare CAD drawings.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Drafting — PROGRAM NUMBER: 8724000

COURSE TITLE: Drafting Skills 4 — COURSE NUMBER: 8724040

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read written and follow oral instructions.
14.03 Answer and ask questions coherently and concisely.
14.04 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.05 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPLIED MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE BASIC SCIENCE AS APPLIED TO DRAFTING -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Drafting and Design Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.020200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 _____ Postsecondary Adult Vocational

__x__ Postsecondary Vocational _______Other _________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230), chief design drafters (017.161-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, drafting standards, math skills and drafting office practices to assist mathematical, electrical and electronic, architectural, chemical, civil, or other engineers in the design and drafting of electrical circuits, machines, structures, weldments or architectural plans. Includes instruction in the preparation of engineering plans, layouts and detailed drawings according to conventional projection principles, preparation of charts, graphs or diagrams, and the use of handbook data germane to design and drafting in various fields.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting with the tools, materials, technical data, calculators and blueprint machines used in the laboratory similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic drafting skills.
02. Prepare mechanical drawings.
03. Prepare electrical/electronic drawings.
04. Prepare pneumatic/hydraulic drawings.
05. Prepare charts and graphs.
06. Apply technical mathematics.
07. Prepare architectural drawings.
08. Prepare computer aided drawings.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Drafting and Design Technology

EFFECTIVE DATE: July, 1993

SECONDARY NUMBER: ________

POSTSECONDARY NUMBER: ______

01.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

01.01 Apply safety practices.
01.02 Operate drafting instruments.
01.03 Perform lettering techniques.
01.04 Prepare multi-view drawings.
01.05 Prepare sectional views.
01.06 Prepare auxiliary views.
01.07 Prepare dimension drawings.
01.08 Prepare pictorial drawings.
01.09 Prepare sketches.
01.10 Prepare title blocks and other formats.
01.11 Apply systems drafting techniques.
01.12 Compile a portfolio.

02.0 PREPARE MECHANICAL DRAWINGS--The student will be able to:

02.01 Prepare fastener drawings.
02.02 Prepare cam drawings.
02.03 Prepare gear drawings.
02.04 Prepare assembly drawings.
02.05 Prepare detail drawings.
02.06 Prepare surface developments.
02.07 Prepare technical drawings.
02.08 Prepare welding drawings.
02.09 Prepare bearing drawings.
02.10 Prepare spring drawings.
02.11 Prepare casting drawings.
02.12 Prepare forging drawings.
02.13 Prepare tool drawings.
02.14 Prepare molding diagrams.
02.15 Prepare drawings with special processed holes.
02.16 Prepare stamping drawings.
02.17 Prepare numerical control drawings.
02.18 Prepare computer aided drawings.

03.0 PREPARE ELECTRICAL/ELECTRONIC DRAWINGS--The student will be able to:

03.01 Prepare schematic drawings.
03.02 Prepare printed circuit board drawings.
03.03 Prepare package drawings.
03.04 Prepare connection drawings.
03.05 Prepare interconnection drawings.
03.06 Prepare cable drawings.
03.07 Prepare cable drawings.
03.08 Prepare harness drawings.
03.09 Prepare component drawings.
03.10 Prepare logic diagrams.

04.0 PREPARE PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

04.01 Prepare piping drawings.
04.02 Prepare pump and motor drawings.
04.03 Prepare cylinder and piston diagrams.

04.04 Prepare valve drawings.
04.05 Prepare pump section drawings.
04.06 Prepare pulley and chain drive drawings.

05.0 PREPARE CHARTS AND GRAPHS--The student will be able to:

05.01 Prepare charts.
05.02 Prepare graphs.

06.0 APPLY TECHNICAL MATHEMATICS--The student will be able to:

06.01 Solve arithmetic problems.
06.02 Solve algebra problems.
06.03 Solve trigonometry problems.
06.04 Solve geometry problems.
06.05 Solve surveying problems.

07.0 PREPARE ARCHITECTURAL DRAWINGS--The student will be able to:

07.01 Prepare floor plan drawings.
07.02 Prepare foundation plan and detail drawings.
07.03 Prepare elevation drawings.
07.04 Prepare landscape layouts.
07.05 Prepare schedules.
07.06 Prepare sections.
07.07 Build architectural models.
07.08 Prepare truss drawings.
07.09 Prepare stairway drawings.
07.10 Prepare fireplace drawings.
07.11 Prepare plot plan drawings.
07.12 Prepare plumbing plan drawings.
07.13 Prepare climate control drawings.
07.14 Prepare electrical plan drawings.

08.0 PREPARE COMPUTER AIDED DRAWINGS--The student will be able to:

08.01 Operate work terminal.
08.02 Utilize system commands.
08.03 Perform drafting procedures.
08.04 Operate peripheral equipment.
08.05 Apply specialized CAD functions.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Dry Cleaning and Laundering

CODE NUMBER: Secondary 8733000   Postsecondary I120101

Florida CIP 0612.010100

SECONDARY SCHOOL CREDITS 3   COLLEGE CREDITS ____   POSTSECONDARY ADULT VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): ____7-9 x 9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational   x Other 30,31

CERTIFICATION COVERAGE: DRY CLEAN @ 7 G   FAB MAINT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as laundry, drycleaning machine operators (92726837), spotters (362.381-010), drycleaners (362.382-014), leather cleaners (362.684-026), all-around pressers (363.682-014) and hand pressers (363.684-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills needed to operate and manage dry cleaning plants including receiving, cleaning, repairing and returning garments to customers.

Listed below are the courses that comprise this program when offered at the secondary level:

8733010	Dry Cleaning and Laundering 1
8733020	Dry Cleaning and Laundering 2
8733030	Dry Cleaning and Laundering 3

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in hands-on experiences with chemicals, implements and equipment appropriate to the program content and in accordance with current practices in the trade. Strong emphasis is placed on stain identification, stain removal, chemical safety and cleaning and finishing garments.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed. In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours. Students may concentrate in the areas of pressing/finishing by completing outcomes 1 and 16-31, or as a spotter cleaner by completing outcomes 1-15 and 29-30.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures of orientation and safety.
02. Use and maintain spotting equipment and tools.
03. Identify fibers and fabrics.
04. Identify and test fabric and dyestuffs.
05. Demonstrate understanding of chemicals and formulas.
06. Identify stains.
07. Remove stains.
08. Explain properties and uses of petroleum and synthetic solvents.
09. Operate synthetic washer-extractors.
10. Operate reclaiming tumblers.
11. Operate filters.
12. Demonstrate troubleshooting skills.
13. Understand proper operation of stills.
14. Operate pumps at maximum efficiency.
15. Clean garments.
16. Adjust and operate utility pressers.
17. Adjust and operate mushroom and automatic pants topper.
18. Adjust and operate automatic leggers.
19. Operate form finishers.
20. Finish slacks and shirts.
21. Finish coats.
22. Finish trousers.
23. Finish dresses.
24. Finish children's garments.
25. Finish pleats and knitted garments.
26. Finish silk.
27. Inspect garments.
28. Perform routine maintenance.
29. Demonstrate employability skills.
30. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8733000

PROGRAM TITLE: Drycleaning and Laundering POSTSECONDARY NUMBER: I120101

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.
01.04 Explain the control limitations.
01.05 Exhibit the ability to check the basket for burrs and pins.
01.06 Demonstrate the ability to adjust the loading doors.
01.07 Define faulty pump.

02.0 USE AND MAINTAIN SPOTTING EQUIPMENT AND TOOLS--The student will be able to:

02.01 Identify the spotter's equipment and tools.
02.02 Utilize the spotter's equipment and tools.
02.03 Write a list of equipment and tools.

03.0 IDENTIFY FIBERS AND FABRICS--The student will be able to:

03.01 Identify fibers and fabrics.
03.02 Explain methods of fabric construction.
03.03 Define the characteristics of fibers.
03.04 Demonstrate burning tests for fiber content.

04.0 IDENTIFY AND TEST FABRICS AND DYESTUFFS--The student will be able to:

04.01 Identify dyestuffs.
04.02 Define the composition of dyestuffs.
04.03 Determine proper cleaning procedure for fabrics and dyes.

05.0 DEMONSTRATE UNDERSTANDING OF CHEMICALS AND FORMULAS--The student will be able to:

05.01 Define the chemical properties of a formula and its effect on fabrics.
05.02 Write a list of formulas used in spotting.
05.03 Write a list of spotting agents.

06.0 IDENTIFY STAINS--The student will be able to:

06.01 Define methods of stain identification.
06.02 Write various methods of stain identification.

07.0 REMOVE STAINS--The student will be able to:

07.01 Identify a stain.
07.02 Demonstrate methods for removing stains.

08.0 EXPLAIN PROPERTIES AND USES OF PETROLEUM AND SYNTHETIC SOLVENTS--The student will be able to:

08.01 Write a brief history on the development of petroleum solvent.
08.02 Write methods for refining petroleum solvents.
08.03 Write specifications for petroleum solvent.

08.04 Write the properties of synthetic solvent.
08.05 Write the methods for making synthetic solvent.

09.0 OPERATE SYNTHETIC WASHER-EXTRACTORS--The student will be able to:

09.01 Demonstrate the ability to set controls on the machine.
09.02 Demonstrate the ability to load the machine with solvent.
09.03 Demonstrate the ability to operate a machine manually.

10.0 OPERATE RECLAIMING TUMBLERS--The student will be able to:

10.01 Exhibit the ability to operate a tumbler.
10.02 Demonstrate the ability to control the temperature on a tumbler.
10.03 Exhibit the ability to operate a drying cabinet.

11.0 OPERATE FILTERS--The student will be able to:

11.01 Exhibit the ability to operate filters.
11.02 Explain the operation of cookers and stills.
11.03 Explain filter maintenance methods.

12.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

12.01 Explain the use of the filter pressure gauge.
12.02 Explain plugged screens, tubes or bags.
12.03 Exhibit the ability to steam clean and boil screens, tubes, or cleaning bags.
12.04 Describe in writing the distilling solvent.
12.05 Exhibit the ability to operate the pump on a filter.

13.0 UNDERSTAND PROPER OPERATION OF STILLS--The student will be able to:

13.01 Explain the causes for slow down in distilling solvent.
13.02 List factors of a worn out pump.
13.03 Explain vacuum leak.
13.04 Explain a steam or water leak.
13.05 Define vacuum still pressure.
13.06 Explain how to clean dirty heating tubes.
13.07 Determine a faulty steam trap.
13.08 Diagnose an odor in a distilled solvent.

14.0 OPERATE PUMPS AT MAXIMUM EFFICIENCY--The student will be able to:

14.01 Demonstrate the reducing or no flow of solvent.
14.02 Define the loss of pump prime.
14.03 Identify position of the valve in either a suction or discharge line.
14.04 Determine the clogged strainers in suction lines.
14.05 Determine the solvent level in tanks below the pump lines.
14.06 Explain a slipping pump drive belt.
14.07 Explain a pressure relief valve, open on gear pumps.
14.08 Explains lint build up on the impeller in the pump.

15.0 CLEAN GARMENTS--The student will be able to:

15.01 Demonstrate understanding of causes for excessive redeposit.
15.02 Explain insufficient filter flow rate.
15.03 Define improper garment classification.
15.04 Explain dissolved garment classification.
15.05 Define causes for excessive oils or greases in solvents.
15.06 Write causes for wrinkles occurring in drycleaning.
15.07 Diagnose causes for garment streaks, slow drying, or spotting rings.

15.08 Determine the reason for objectionable odors.
15.09 Define bleeding of dyes.
15.10 Describe dye or soil pick-up in local areas.
15.11 Explain restoration procedures of insoluble soil.
15.12 Demonstrate the method for softening plastic-coated fabrics.

16.0 ADJUST AND OPERATE UTILITY PRESSERS--The student will be able to:

16.01 Write specifications for the utility press.
16.02 Demonstrate ability to operate the utility press.
16.03 Perform maintenance procedure.
16.04 Demonstrate variable pressure operation.
16.05 Demonstrate the iron attachment.

17.0 ADJUST AND OPERATE MUSHROOM AND AUTOMATIC PANTS TOPPER--The student will be able to:

17.01 State specifications for the topper press.
17.02 Demonstrate the operation of the pants topper.
17.03 Explain the timer on an automatic topper press.
17.04 Demonstrate programmer adjustment procedures on the topper.

18.0 ADJUST AND OPERATE AUTOMATIC LEGGERS--The student will be able to:

18.01 State specifications for the automatic legger.
18.02 Demonstrate the operation of the legger.
18.03 Define the timer on the legger.
18.04 Demonstrate the mechanical adjustment of the legger.

19.0 OPERATE FORM FINISHERS--The student will be able to:

19.01 List specifications for the form finisher.
19.02 Exhibit steps for the timer on a form finisher.
19.03 Demonstrate the operation of the form finisher.
19.04 Perform the steps for finishing a coat.
19.05 Perform the steps for finishing a dress.

20.0 FINISH SLACKS AND SKIRTS--The student will be able to:

20.01 Demonstrate steps necessary to place back, left hip of slacks on mushroom press.
20.02 Describe steps necessary to place back, right hip of slacks on mushroom press.
20.03 Demonstrate steps necessary to place front, right hip of slacks on press.
20.04 Demonstrate steps necessary to place front, left hip of slacks on press.
20.05 State the methods of legging slacks on regular press.
20.06 Demonstrate the methods necessary when finishing skirts.

21.0 FINISH COATS--The student will be able to:

21.01 Exhibit procedures for finishing coats on a form finisher and utility press.
21.02 Demonstrate steps in finishing sleeves on coats.
21.03 Exhibit methods of finishing coat collars.
21.04 Demonstrate steps in finishing the front left shoulder and sleeve head.
21.05 Exhibit steps in finishing front lay.
21.06 Demonstrate methods of finishing lapels.
21.07 Demonstrate steps in finishing linings.

22.0 FINISH TROUSERS--The student will be able to:

22.01 Demonstrate procedures in topping trousers on upright presser.
22.02 Demonstrate steps in finishing trouser tops or waistbands.
22.03 Demonstrate steps in finishing pockets on trousers.
22.04 Demonstrate steps in finishing left legs of trousers.
22.05 Demonstrate steps in finishing right legs of trousers.

23.0 FINISH DRESSES--The student will be able to:

23.01 Demonstrate operations for finishing sleeves on dresses.
23.02 Demonstrate steps in finishing collars and lapels on dresses.
23.03 Demonstrate process of finishing blouses.
23.04 Demonstrate steps for finishing skirts or dresses.

24.0 FINISH CHILDREN'S GARMENTS--The student will be able to:

24.01 Demonstrate methods of finishing a sleeve on a child's coat.
24.02 Demonstrate steps in finishing collars and trim.
24.03 Demonstrate steps in finishing fronts and backs of coats.
24.04 Demonstrate methods of finishing trousers.
24.05 Exhibit techniques for finishing boys' and girls' jackets.

25.0 FINISH PLEATS AND KNITTED GARMENTS--The student will be able to:

25.01 Demonstrate steps for finishing pleats.
25.02 Demonstrate procedures for finishing pleats on the sleeve board.
25.03 Demonstrate methods for finishing pleats on the utility press.
25.04 Demonstrate methods for finishing knitted garments.
25.05 Perform methods for measuring knitted garments before and after finishing.
25.06 List methods of handling finished knitted garments.

26.0 FINISH SILK--The student will be able to:

26.01 Finish sleeves on the sleeve puff iron.
26.02 Finish a skirt on the long press.
26.03 Finish collars and lapels.
26.04 Finish collars and lapels.
26.05 Demonstrate steps in touch-up of finished garments.

27.0 INSPECT GARMENTS--The student will be able to:

27.01 Demonstrate methods of inspection.
27.02 Define points of inspection in the order in which work has processed through various departments.
27.03 State processes for inspecting garments which need special attention.

28.0 ROUTINE MAINTENANCE--The student will be able to:

28.01 Determine causes of machine malfunction.
28.02 Perform preventative maintenance.
28.03 Perform shop housekeeping duties.
28.04 Explain and demonstrate proper handling and storage of flammable and/or toxic materials.

29.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

29.01 Conduct a job search.
29.02 Secure information about a job.
29.03 Identify documents required when applying for a job interview.

29.04 Complete a job application form correctly.
29.05 Demonstrate competence in job interview techniques.
29.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
29.07 Demonstrate acceptable work habits.
29.08 Demonstrate knowledge of how to make appropriate job changes.
29.09 Demonstrate acceptable employee health habits.
29.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

30.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

30.01 Define entrepreneurship.
30.02 Describe the importance of entrepreneurship to the American economy.
30.03 List advantages and disadvantages of business ownership.
30.04 Identify risks involved in ownership of a business.
30.05 Identify personal characteristics of a successful entrepreneur.
30.06 Identify business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Drycleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 1 COURSE NUMBER: 8733010

COURSE DESCRIPTION:

This course will include orientation on safety, spotting, stain removal and employability skills.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.
01.04 Explain the control limitations.
01.05 Exhibit the ability to check the basket for burrs and pins.
01.06 Demonstrate the ability to adjust the loading doors.
01.07 Define faulty pump.

02.0 USE AND MAINTAIN SPOTTING EQUIPMENT AND TOOLS--The student will be able to:

02.01 Identify the spotter's equipment and tools.
02.02 Utilize the spotter's equipment and tools.
02.03 Write a list of equipment and tools.

03.0 IDENTIFY FIBERS AND FABRICS--The student will be able to:

03.01 Identify fibers and fabrics.
03.02 Explain methods of fabric construction.
03.03 Define the characteristics of fibers.
03.04 Demonstrate burning tests for fiber content.

04.0 IDENTIFY AND TEST FABRICS AND DYESTUFFS--The student will be able to:

04.01 Identify dyestuffs.
04.02 Define the composition of dyestuffs.
04.03 Determine proper cleaning procedure for fabrics and dyes.

05.0 DEMONSTRATE UNDERSTANDING OF CHEMICALS AND FORMULAS--The student will be able to:

05.01 Define the chemical properties of a formula and its effect on fabrics.
05.02 Write a list of formulas used in spotting.
05.03 Write a list of spotting agents.

06.0 IDENTIFY STAINS--The student will be able to:

06.01 Define methods of stain identification.
06.02 Write various methods of stain identification.

07.0 REMOVE STAINS--The student will be able to:

07.01 Identify a stain.
07.02 Demonstrate methods for removing stains.

08.0 EXPLAIN PROPERTIES AND USES OF PETROLEUM AND SYNTHETIC SOLVENTS--The student will be able to:

08.01 Write a brief history on the development of petroleum solvent.
08.02 Write methods for refining petroleum solvents.
08.03 Write specifications for petroleum solvent.
08.04 Write the properties of synthetic solvent.
08.05 Write the methods for making synthetic solvent.

29.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

29.01 Conduct a job search.
29.02 Secure information about a job.
29.03 Identify documents required when applying for a job interview.
29.04 Complete a job application form correctly.
29.05 Demonstrate competence in job interview techniques.
29.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
29.07 Demonstrate acceptable work habits.
29.08 Demonstrate knowledge of how to make appropriate job changes.
29.09 Demonstrate acceptable employee health habits.
29.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

30.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

30.01 Define entrepreneurship.
30.02 Describe the importance of entrepreneurship to the American economy.
30.03 List advantages and disadvantages of business ownership.
30.04 Identify risks involved in ownership of a business.
30.05 Identify personal characteristics of a successful entrepreneur.
30.06 Identify business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Drycleaning and Laundering

PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 2

COURSE NUMBER: 8733020

COURSE DESCRIPTION:

This course provides instruction and shop/lab experience in operation of dry cleaning and laundry machines.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.
01.04 Explain the control limitations.
01.05 Exhibit the ability to check the basket for burrs and pins.
01.06 Demonstrate the ability to adjust the loading doors.
01.07 Define faulty pump.

09.0 OPERATE SYNTHETIC WASHER-EXTRACTORS--The student will be able to:

09.01 Demonstrate the ability to set controls on the machine.
09.02 Demonstrate the ability to load the machine with solvent.
09.03 Demonstrate the ability to operate a machine manually.

10.0 OPERATE RECLAIMING TUMBLERS--The student will be able to:

10.01 Exhibit the ability to operate a tumbler.
10.02 Demonstrate the ability to control the temperature on a tumbler.
10.03 Exhibit the ability to operate a drying cabinet.

11.0 OPERATE FILTERS--The student will be able to:

11.01 Exhibit the ability to operate filters.
11.02 Explain the operation of cookers and stills.
11.03 Explain filter maintenance methods.

12.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

12.01 Explain the use of the filter pressure gauge.
12.02 Explain plugged screens, tubes or bags.
12.03 Exhibit the ability to steam clean and boil screens, tubes, or cleaning bags.
12.04 Describe in writing the distilling solvent.
12.05Exhibit the ability to operate the pump on a filter.

13.0 UNDERSTAND PROPER OPERATION OF STILLS--The student will be able to:

13.01 Explain the causes for slow down in distilling solvent.
13.02 List factors of a worn out pump.
13.03 Explain vacuum leak.
13.04 Explain a steam or water leak.
13.05 Define vacuum still pressure.
13.06 Explain how to clean dirty heating tubes.
13.07 Determine a faulty steam trap.
13.08 Diagnose an odor in a distilled solvent.

14.0 OPERATE PUMPS AT MAXIMUM EFFICIENCY--The student will be able to:

14.01 Demonstrate the reducing or no flow of solvent.
14.02 Define the loss of pump prime.
14.03 Identify position of the valve in either a suction or discharge line.
14.04 Determine the clogged strainers in suction lines.
14.05 Determine the solvent level in tanks below the pump lines.
14.06 Explain a slipping pump drive belt.
14.07 Explain a pressure relief valve, open on gear pumps.
14.08 Explains lint build up on the impeller in the pump.

15.0 CLEAN GARMENTS--The student will be able to:

15.01 Demonstrate understanding of causes for excessive redeposit.
15.02 Explain insufficient filter flow rate.
15.03 Define improper garment classification.
15.04 Explain dissolved garment classification.
15.05 Define causes for excessive oils or greases in solvents.
15.06 Write causes for wrinkles occurring in drycleaning.
15.07 Diagnose causes for garment streaks, slow drying, or spotting rings.
15.08 Determine the reason for objectionable odors.
15.09 Define bleeding of dyes.
15.10 Describe dye or soil pick-up in local areas.
15.11 Explain restoration procedures of insoluble soil.
15.12 Demonstrate the method for softening plastic-coated fabrics.

28.0 ROUTINE MAINTENANCE--The student will be able to:

28.01 Determine causes of machine malfunction.
28.02 Perform preventative maintenance.
28.03 Perform shop housekeeping duties.
28.04 Explain and demonstrate proper handling and storage of flammable and/or toxic materials.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July,1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Drycleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 3 COURSE NUMBER: 8733030

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in operation of pressing and finishing machines.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.
01.04 Explain the control limitations.
01.05 Exhibit the ability to check the basket for burrs and pins.
01.06 Demonstrate the ability to adjust the loading doors.
01.07 Define faulty pump.

16.0 ADJUST AND OPERATE UTILITY PRESSERS--The student will be able to:

16.01 Write specifications for the utility press.
16.02 Demonstrate ability to operate the utility press.
16.03 Perform maintenance procedure.
16.04 Demonstrate variable pressure operation.
16.05 Demonstrate the iron attachment.

17.0 ADJUST AND OPERATE MUSHROOM AND AUTOMATIC PANTS TOPPER--The student will be able to:

17.01 State specifications for the topper press.
17.02 Demonstrate the operation of the pants topper.
17.03 Explain the timer on an automatic topper press.
17.04 Demonstrate programmer adjustment procedures on the topper.

18.0 ADJUST AND OPERATE AUTOMATIC LEGGERS--The student will be able to:

18.01 State specifications for the automatic legger.
18.02 Demonstrate the operation of the legger.
18.03 Define the timer on the legger.
18.04 Demonstrate the mechanical adjustment of the legger.

19.0 OPERATE FORM FINISHERS--The student will be able to:

19.01 List specifications for the form finisher.
19.02 Exhibit steps for the timer on a form finisher.
19.03 Demonstrate the operation of the form finisher.
19.04 Perform the steps for finishing a coat.
19.05Perform the steps for finishing a dress.

20.0 FINISH SLACKS AND SKIRTS--The student will be able to:

20.01 Demonstrate steps necessary to place back, left hip of slacks on mushroom press.
20.02 Describe steps necessary to place back, right hip of slacks on mushroom press.
20.03 Demonstrate steps necessary to place front, right hip of slacks on

press.
20.04 Demonstrate steps necessary to place front, left hip of slacks on press.
20.05 State the methods of legging slacks on regular press.
20.06 Demonstrate the methods necessary when finishing skirts.

21.0 FINISH COATS--The student will be able to:

21.01 Exhibit procedures for finishing coats on a form finisher and utility press.
21.02 Demonstrate steps in finishing sleeves on coats.
21.03 Exhibit methods of finishing coat collars.
21.04 Demonstrate steps in finishing the front left shoulder and sleeve head.
21.05 Exhibit steps in finishing front lay.
21.06 Demonstrate methods of finishing lapels.
21.07Demonstrate steps in finishing linings.

22.0 FINISH TROUSERS--The student will be able to:

22.01 Demonstrate procedures in topping trousers on upright presser.
22.02 Demonstrate steps in finishing trouser tops or waistbands.
22.03 Demonstrate steps in finishing pockets on trousers.
22.04 Demonstrate steps in finishing left legs of trousers.
22.05Demonstrate steps in finishing right legs of trousers.

23.0 FINISH DRESSES--The student will be able to:

23.01 Demonstrate operations for finishing sleeves on dresses.
23.02 Demonstrate steps in finishing collars and lapels on dresses.
23.03 Demonstrate process of finishing blouses.
23.04 Demonstrate steps for finishing skirts or dresses.

24.0 FINISH CHILDREN'S GARMENTS--The student will be able to:

24.01 Demonstrate methods of finishing a sleeve on a child's coat.
24.02 Demonstrate steps in finishing collars and trim.
24.03 Demonstrate steps in finishing fronts and backs of coats.
24.04 Demonstrate methods of finishing trousers.
24.05 Exhibit techniques for finishing boys' and girls' jackets.

25.0 FINISH PLEATS AND KNITTED GARMENTS--The student will be able to:

25.01 Demonstrate steps for finishing pleats.
25.02 Demonstrate procedures for finishing pleats on the sleeve board.
25.03 Demonstrate methods for finishing pleats on the utility press.
25.04 Demonstrate methods for finishing knitted garments.
25.05 Perform methods for measuring knitted garments before and after finishing.
25.06 List methods of handling finished knitted garments.

26.0 FINISH SILK--The student will be able to:

26.01 Finish sleeves on the sleeve puff iron.
26.02 Finish a skirt on the long press.
26.03 Finish collars and lapels.
26.04 Finish collars and lapels.
26.05 Demonstrate steps in touch-up of finished garments.

27.0 INSPECT GARMENTS--The student will be able to:

27.01 Demonstrate methods of inspection.

27.02 Define points of inspection in the order in which work has processed through various departments.

27.03 State processes for inspecting garments which need special attention.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Drywall Installation

CODE NUMBER: Secondary ______ Postsecondary I460404

Florida CIP 0646.040400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__ Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G DRYWALL @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drywall installers (87108546), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of ladders and scaffolds, materials, and tools, to install wallboard, plasterboard or other interior surfaces in structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the installation and finishing of drywall materials.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Perform material and cost estimations.
03. Select, use and maintain tools and equipment.
04. Erect and use scaffolds, ladders, and stilts.
05. Install drywall on wood and metal framing.
06. Tape, compound, and finish drywall.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate math skills.
09. Demonstrate appropriate understanding of basic science.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education | SECONDARY NUMBER: __________

PROGRAM TITLE: Dry Wall Installation | POSTSECONDARY NUMBER: I460404

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Apply math skills.
01.02 Read scales and measuring instruments.
01.03 Read and interpret types of dimensions.
01.04 Read and interpret pictorial drawings.
01.05 Read and interpret supplemental information.
01.06 Read and interpret floor plan drawings.
01.07 Read and interpret schedules.
01.08 Read and interpret roof-framing and ceiling plans.
01.09 Read and interpret specifications.
01.10 Read and interpret detail drawings and sketches.
01.11 Read, interpret and use symbols and abbreviations.
01.12 Prepare and use freehand sketches.
01.13 Prepare and use vertical, horizontal and overhead panel arrangements.

02.0 PERFORM MATERIAL AND COST ESTIMATIONS--The student will be able to:

02.01 Compile a list of supplies and materials from working drawings, written instructions or verbal instruction.
02.02 Compile labor costs.
02.03 Compile equipment cost, to include renting, purchasing, leasing and maintenance.
02.04 Compile overhead costs.

03.0 SELECT, USE AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

03.01 Demonstrate knowledge of safety skills, first aid, OSHA, Workers Compensation Law, workers liability and responsibility on the job site.
03.02 Apply safety rules and procedures at the job site and training site.
03.03 Demonstrate safety devices, equipment and the application of first aid techniques.
03.04 Demonstrate the safe transportation, maintenance and storage of tools and equipment.
03.05 Demonstrate safe use of hand tools, reciprocating saw, saber saw, drywall nailer, electric drill with depth adjusting clutch, mechanical taping tool, spray gun, finisher, adjustable stilts, automatic tape "banjo", portable power saw, ladders, scaffolds and power mixers.

04.0 ERECT AND USE SCAFFOLDS, LADDERS AND STILTS--The student will be able to:

04.01 Transport, assemble, use, disassemble and store scaffolding in accordance with industry practices and OSHA standards for wooden pole, tube and clamp, tubular welded frame and mobile categories.
04.02 Transport, set, adjust, use and store portable straight ladders and extension ladders including extensions.
04.03 Assemble, adjust, maintain and use adjustable stilts.

05.0 INSTALL DRYWALL ON WOOD AND METAL FRAMING--The student will be able to:

05.01 Select appropriate drywall materials according to type, thickness and edges requirements.
05.02 Measure and cut wallboard, including inside cuts, curves and irregular shapes.
05.03 Select and use appropriate fasteners or adhesives to mount wallboard to wooden framing, metal framing, new work or old work.
05.04 Fasten several types of metal corner beads and channel trim on edges and openings.
05.05 Apply single layer and double layer construction (two-ply) over wood framing.

06.0 TAPE, COMPOUND AND FINISH DRYWALL--The student will be able to:

06.01 Apply joint compound and reinforcing tape.
06.02 Apply pressure sensitive glass-fiber tape and compound.
06.03 Finish wallboard to receive other coverings.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.

10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electric Line Service and Repair

CODE NUMBER: Secondary ______ Postsecondary I460303

Florida CIP 0646.030300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__ Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30.31__

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electrical power line installers (85723607), line repairers (821.361-026), line maintainers (821.261-014), line erectors (821.361-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, installation, operation, and maintenance of local, long distance, and rural power lines; erection and construction of pole and tower lines; and installation of underground lines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the construction of utility power transmission lines and equipment used to conduct electrical energy between generating stations, substations, and consumers. All phases of overhead and underground power line installation is covered.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may he offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic electrical/electronic principles.
02. Install electrical distribution systems.
03. Perform street and security lighting activities.
04. Perform maintenance and inspection duties.
05. Troubleshoot and repair system components.
06. Utilize electrical line service tools and equipment.
07. Perform operator functions on high reach trucks.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

SECONDARY NUMBER: ______

PROGRAM TITLE: Electric Line Service and Repair

POSTSECONDARY NUMBER: I460303

01.0 APPLY BASIC ELECTRICAL/ELECTRONIC PRINCIPLES--The student will be able to:

01.01 Interpret electrical terms.
01.02 Identify electrical symbols.
01.03 Construct common electrical circuits.
01.04 Compute for voltage, current, resistance and power.
01.05 Operate meters to measure electrical properties.
01.06 Discuss transformer theory.
01.07 Apply electronic principles where applicable.
01.08 Interpret electronic terms and symbols.

02.0 INSTALL ELECTRICAL DISTRIBUTION SYSTEMS--The student will be able to:

02.01 Set poles manually and using power equipment.
02.02 Transport, unload and position poles.
02.03 Frame pole.
02.04 Install guy anchor and wires.
02.05 Climb poles using climbing equipment.
02.06 Hoist materials or equipment to lines.
02.07 String conductors.
02.08 Cut or splice conductors.
02.09 Sag conductors.
02.10 Install tie wires.
02.11 Fabricate tie wires.
02.12 Install pole equipment (crossarms, transformers, fuse cutouts, insulators, air switches, arrestors and pole steps).
02.13 Install capacitor banks.
02.14 Install substation equipment.
02.15 Install utility meters.
02.16 Cut, thread, and bend metal conduit.
02.17 Install armor rods.
02.18 Install direct burial cable.
02.19 Install cable markers.
02.20 Fabricate underground duct systems.
02.21 Install underground cable ducts.
02.22 Rig manholes for cable pulling.
02.23 Splice high voltage underground cable.
02.24 Terminate high voltage cable underground and above ground.
02.25 Install cable racks.
02.26 Install and test grounding systems.

03.0 PERFORM STREET AND SECURITY LIGHTING ACTIVITIES--The student will be able to:

03.01 Install street light fixtures.
03.02 Install flood light fixtures.
03.03 Install lighting control components.
03.04 Install ballast.
03.05 Isolate system for test.
03.06 Adjust timers and controls.
03.07 Relamp fixtures.

04.0 PERFORM MAINTENANCE AND INSPECTION DUTIES--The student will be able to:

04.01 Control vegetation in powerline right-of-way.
04.02 Control vegetation in substations.
04.03 Inspect conductors for uniform sag.
04.04 Inspect poles and crossarms.
04.05 Check for corroded hardware.
04.06 Check fuse cutouts.
04.07 Check high voltage switches.
04.08 Check circuit breakers and regulators.
04.09 Inspect fences and warning signs.
04.10 Perform di-electric tests.
04.11 Perform load test.
04.12 Maintain all electrical components.
04.13 Recover equipment.
04.14 Read service meters.
04.15 Realign existing poles.
04.16 Pump water from manholes.
04.17 Check for deterioration of cable, connectors, and poles.

05.0 TROUBLESHOOT AND REPAIR SYSTEM COMPONENTS--The student will be able to:

05.01 Replace defective conductor.
05.02 Transfer dead conductor to new pole.
05.03 Remove foreign objects from conductor.
05.04 Transfer hot conductor to new pole.
05.05 Splice dead or hot conductors.
05.06 Convert transformer banks to open delta.
05.07 Replace crossarms.
05.08 Climb through hot equipment using rubber protective devices.
05.09 Trace faulty underground cable.
05.10 Replace substation breakers, transformers, regulators, and relays.

06.0 UTILIZE ELECTRICAL LINE SERVICE TOOLS AND EQUIPMENT--The student will be able to:

06.01 Utilize handtools safely.
06.02 Utilize hotline tools safely.
06.03 Utilize rubber protection as needed.
06.04 Operate pool trailer.
06.05 Operate reel jacks.
06.06 Operate cable pulling guide.
06.07 Operate shop power tools.
06.08 Operate hoist.
06.09 Operate climbing equipment.
06.10 Operate multimeter.
06.11 Operate clamp-on ammeter.
06.12 Operate phase rotation meter.
06.13 Operate meter.
06.14 Operate gas detector.
06.15 Operate hot stick tester.
06.16 Operate high voltage phase tester.
06.17 Operate recording ammeter/voltmeter.
06.18 Operate relay tester.
06.19 Operate vibro ground
06.20 Operate power trencher.
06.21 Clean facilities and shop.

07.0 PERFORM OPERATOR FUNCTIONS ON HIGH REACH TRUCK--The student will be able to:

07.01 Operate line maintenance truck.
07.02 Operate high reach.
07.03 Test reach booms.

07.04 Position truck safely.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.

12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electric Motor and Generator Mechanics

CODE NUMBER: Secondary ______ Postsecondary I470107

Florida CIP 0647.010700

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): _____7-9 _____9-12 X Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as electric motor repairers (85714614), (721.281-018) or to provide supplemental training for persons previously or currently employed in this occupation.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the assembly, installation, testing, maintenance and repair of electric motors, generators, transformers and related equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools and equipment required to test, maintain, and rebuild electric motors, ranging from domestic to commercial application.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of procedures.
02. Demonstrate knowledge of safety procedures.
03. Demonstrate knowledge of electrical fundamentals.
04. Demonstrate use of hand tools and bench skills.
05. Identify and describe operation of electrical and mechanical components of electric motors and controls.
06. Demonstrate use of test equipment.
07. Demonstrate understanding of theory and characteristics of electric motors.
08. Demonstrate troubleshooting skills.
09. Repair electric motors.
10. Perform rewinding operations.
11. Perform preventative maintenance.
12. Install component protectors and controls.
13. Select motor replacements.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Electric Motor and Generator Mechanics

EFFECTIVE DATE: July, 1993

SECONDARY NUMBER: ________

POSTSECONDARY NUMBER: I470107

01.0 DEMONSTRATE KNOWLEDGE OF PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of school policies and procedures.
01.02 Explain shop safety rules.
01.03 List opportunities and qualification for employment in the electric motor trade.

02.0 DEMONSTRATE KNOWLEDGE OF SAFETY PROCEDURES--The student will be able to:

02.01 Locate and identify types of fire extinguishers in classroom and shop areas.
02.02 Demonstrate the safe use of shop equipment.
02.03 Identify electrical shock hazards.

03.0 DEMONSTRATE KNOWLEDGE OF ELECTRICAL FUNDAMENTALS--The student will be able to:

03.01 Explain electrical theory in circuits as it relates to direct and alternating current.
03.02 Analyze and explain series, parallel and series - parallel circuits using Ohms law.
03.03 Explain magnetic theory as it relates to the production of electricity.
03.04 Recognize and draw basic electrical circuits and symbols.

04.0 DEMONSTRATE USE OF HAND TOOLS AND BENCH SKILLS--The student will be able to:

04.01 Name, identify, use and maintain hand tools.
04.02 Use and maintain measuring instruments.
04.03 Use and maintain drills.
04.04 Use and maintain grinders.
04.05 Use and maintain presses.
04.06 Use and maintain impact tools.
04.07 Soft solder wires and components.
04.08 Perform acetylene welding, brazing, and cutting of ferrous and non-ferrous materials.
04.09 Perform electric welding and cutting.
04.10 Perform basic trueing on a metal lathe.
04.11 Perform basic straightening on a lathe.
04.12 Perform basic machining on a lathe.
04.13 Perform basic undercutting on a lathe.

05.0 IDENTIFY AND DESCRIBE OPERATION OF ELECTRICAL AND MECHANICAL COMPONENTS OF ELECTRIC MOTORS AND CONTROLS--The student will be able to:

05.01 Identify and describe electrical components and their function.
05.02 Adjust electrical components.
05.03 Identify, test and adjust mechanical components.

06.0 DEMONSTRATE USE OF TEST EQUIPMENT--The student will be able to:

06.01 Demonstrate the safe and proper use of basic test equipment.
06.02 Demonstrate the use of a volt-ohm meter to find voltage in a

711

specific electrical circuit.
06.03 Demonstrate the use of a volt-ohm meter to find resistance in a specific electrical circuit.
06.04 Demonstrate various methods for testing electric motor windings and coils for grounds and shorts.
06.05 Test open circuits in windings.
06.06 Diagnose a burned-out winding, using odor, visual inspection and the use of test equipment.
06.07 Test related electrical components for electric motors using the proper equipment.

07.0 DEMONSTRATE UNDERSTANDING OF THEORY AND CHARACTERISTICS OF ELECTRIC MOTORS--The student will be able to:

07.01 Describe the operation of shaded pole motors.
07.02 Describe the operation of split phase motors.

07.03 Describe the operation of permanent split-capacitor motors.
07.04 Describe the operation of capacitor start motors.
07.05 Describe the operation of repulsion induction motors.
07.06 Describe the operation of capacitor start-capacitor run motors.
07.07 Read and interpret schematics for split phase motors.
07.08 Read and interpret schematics for permanent split-capacitor motors.
07.09 Read and interpret schematics for capacitor start motors.
07.10 Read and interpret schematics for shaded pole motors.
07.11 Read and interpret schematics for capacitor start-capacitor run motors.
07.12 Read and interpret schematics for repulsion induction motors.
07.13 Read and interpret line and circular diagrams for internal connections of basic single phase motors.
07.14 Read and interpret basic schematics for Wye(star) and Delta Polyphase motors.
07.15 Read and interpret line and circular diagrams for the internal connections of basic Wye(star) and Delta Polyphase motors.

08.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

08.01 Demonstrate proper troubleshooting techniques.
08.02 Perform visual and odor inspections.
08.03 Demonstrate proper use of VOM, series test light, armatures and megger.
08.04 Bench test for grounds.
08.05 Bench test for proper amperage.
08.06 Perform noise/sound tests.
08.07 Demonstrate use of factory reference manuals.
08.08 Troubleshoot grounded motor on component.
08.09 Locate open circuit in motor or component.
08.10 Locate short in motor or component.
08.11 Locate burned out fault in motor or component.

09.0 REPAIR ELECTRIC MOTORS--The student will be able to:

09.01 Properly mark parts and disassemble motors.
09.02 Complete work order for troubleshooting results, proper operating voltage, and direction of rotation, work to be done and work completed.
09.03 Visually inspect and test electrical and mechanical component parts.
09.04 Clean and lubricate component parts.
09.05 Adjust, service, and replace component parts.
09.06 Properly reassemble and safety bench test electric motors using

the proper test equipment.
09.07 Demonstrate safe work habits while performing manipulative skills.
09.08 Wash and paint motors.
09.09 Clean or replace name plates.
09.10 Polish, dress and lubricate shafts.

10.0 PERFORM REWINDING OPERATIONS--The student will be able to:

10.01 Identify and record external lead and wiring connections.
10.02 Draw internal winding connections.
10.03 Complete accurate data card including external and internal connections and winding information.
10.04 Rewind and connect stators and armatures to industry standards.
10.05 Test winding for grounds, shorts and opens using the proper test equipment.
10.06 Demonstrate safe work habits while performing manipulative skills.

11.0 PERFORM PREVENTATIVE MAINTENANCE--The student will be able to:

11.01 Service, clean, lubricate and adjust components and motors while performing preventive maintenance.
11.02 Use proper safety precautions while performing preventive maintenance.

12.0 INSTALL COMPONENTS PROTECTORS AND CONTROLS--The student will be able to:

12.01 List the types and explain the application and operation of motor protectors listed.
12.02 List the types and explain the application and operation of motor controls listed.
12.03 Safely install component protectors and controls.

13.0 SELECT MOTOR REPLACEMENTS--The student will be able to:

13.01 Explain the information found on the motor nameplate as specified by the instructor.
13.02 Select proper motor replacements as specified by the instructor.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.

15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electrical Power Technology

CODE NUMBER: Secondary _______ Postsecondary:

Florida CIP 0615.030200

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational ______ Other ________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an electrical and electronics technician (22505222), power generation and distribution technician, engineering aide, engineering technician, engineering assistant, instrumentation technician, relay technician, electrical technician, test technician, rotating machinery technician, research technician, research and development technician and calibration lab technician or in a related occupation in electrical power.

Graduates of this program will be prepared for entry-level employment in electrical power technology related occupations.

The program content includes, but is not limited to, DC/AC circuits, power generation, power distribution, instrumentation and electrical network analysis, design, theory, solid state devices, and analog circuits. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient workplace practices, use of circuit diagrams and schematics, soldering, laboratory practices, and technical recording and reporting.

II. LABORATORY ACTIVITIES: Electrical energy laboratory activities are an integral part of this program. The tools, test equipment, materials, and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electrical energy industry for the purpose of analyzing, troubleshooting and repairing electrical energy equipment.

III. SPECIAL NOTE: The program shall contain a core of general education courses which include components in the areas of oral and written communication skills, computation skills in algebra and trigonometry. A minimum of 15 semester credit hours of college level general education preparation is necessary to ensure graduates are able to function on a life-long basis in a rapidly changing and increasingly technical occupation.

On site visits to electrical power facilities for practical experience are essential to the program.

Algebra is recommended as a prerequisite for entry into the program.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid state devices.
05. Demonstrate proficiency in technical recording and reporting.
06. Demonstrate proficiency in DC network analysis.
07. Demonstrate proficiency in AC network and coupled circuit analysis.
08. Demonstrate proficiency in principles of rotating machinery.
09. Demonstrate proficiency in principles of power generation systems.
10. Demonstrate proficiency in principles of transformers.
11. Demonstrate proficiency in principles of power transmission systems.
12. Demonstrate proficiency in principles of power distribution systems.
13. Demonstrate proficiency in principles of switchgear, motor control centers, control panels and AC breaker panels.
14. Demonstrate proficiency in interpretation of electric codes.
15. Demonstrate proficiency in employability skills.
16. Demonstrate an understanding of entrepreneurship.

Intended outcomes for GENERATION OPTION:

17. Demonstrate proficiency in generators, exciters, and voltage regulators.
18. Demonstrate proficiency in transformers.
19. Demonstrate proficiency in switchgear, motor control centers, breakers panels, and AC and DC plant power distribution.
20. Demonstrate proficiency in protective devices.
21. Demonstrate proficiency in power cable, control cable, instrumentation cable and raceways.
22. Demonstrate proficiency in grounding.
23. Demonstrate proficiency in motors.
24. Demonstrate proficiency in the plant cycle (both I & C and electric).
25. Demonstrate proficiency in electric motors.

Intended outcomes for INSTRUMENTATION and CONTROL OPTION:

26. Demonstrate proficiency in the plant cycle (both I & C and electric).
27. Demonstrate proficiency in primary elements and transmitters.
28. Demonstrate proficiency in final elements.
29. Demonstrate proficiency in process control.
30. Demonstrate proficiency in microprocessor systems.
31. Demonstrate proficiency in combustion control.
32. Demonstrate proficiency in electric motor control.
33. Demonstrate proficiency in digital circuits.

Intended outcomes for DISTRIBUTION OPTION:

34. Demonstrate proficiency in the application of transformers.
35. Demonstrate proficiency in the use of electrical equipment.
36. Demonstrate proficiency in the principles of system protection.
37. Demonstrate proficiency in 3 phase power systems analysis.
38. Demonstrate proficiency in distribution circuit design.
39. Demonstrate proficiency in basic surveying skills.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	SECONDARY NUMBER:	
PROGRAM TITLE:	Electrical Power Technology	POSTSECONDARY NUMBER:	

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES. The student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections to include power conductor connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS. The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC content).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of the matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply OHM's Law and power formula.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using VOM and DVM meters and oscilloscopes.
02.09 Compute conductance and measure resistance of conductors and insulators.
02.10 Apply OHM's Law to series circuits.
02.11 Construct and verify the operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply OHM's Law to parallel circuits.
02.14 Construct and verify the operation of a parallel circuit.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply OHM's Law to series-parallel/parallel-series circuits.
02.17 Construct and verify the operation of series-parallel/parallel-series and bridge circuits.
02.18 Troubleshoot series-parallel/parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define RC and RL time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS. The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electrical

technology (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter, and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine RC and RL Time constants.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of RLC circuits (series, parallel, and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel, and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot RC, RL, and RLC circuits.
03.21 Define the characteristics of polyphase circuits.
03.22 Define the basic motor theory and operation.
03.23 Define the basic generator theory and operation.
03.24 Set up and operate power supplies for AC circuits.
03.25 Analyze and measure power in AC circuits (real, reactive and apparent power).
03.26 Set up and operate capacitor/inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID STATE DEVICES. The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes (xener, M.O.V. for example metal oxide).
04.04 Construct diodes circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and application of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors. (FET's).
04.08 Identify and define operating characteristics and applications of single stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor/inductor analyzers for solid state devices.

04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING. The student will be able to:

05.01 Draw engineering electrical sketches, interpret electrical schematics, wiring diagrams, charts, graphs and geographical sketches.
05.02 Record data and design curves and graphs.
05.03 Write reports and make oral presentations.
05.04 Maintain test logs.
05.05 Make equipment failure reports.
05.06 Specify and requisition simple electrical components.
05.07 Compose technical letters and memoranda.
05.08 Write formal reports of laboratory experiences.
05.09 Draft installation preventive maintenance and calibration procedures.

06.0 DEMONSTRATE PROFICIENCY IN DC NETWORK ANALYSIS. The student will be able to:

06.01 Analyze multisource circuits using Millman's Theorem.
06.02 Analyze multisource circuits using Superimposition Theorem.
06.03 Analyze multisource circuits using Mesh Currents.
06.04 Analyze multisource circuits using Branch Currents.
06.05 Analyze multisource circuits using Nodal Analysis.
06.06 Analyze multisource circuits using Thevenin's Theorem.
06.07 Analyze multisource circuits using Norton's Theorem.
06.08 Analyze DC circuits using computer programs.

07.0 DEMONSTRATE PROFICIENCY IN AC NETWORK AND COUPLED CIRCUIT ANALYSIS. The student will be able to:

07.01 Design and analyze magnetic circuits.
07.02 Apply Faraday's Law of induced voltages.
07.03 Solve for mutual inductance in a coupled circuit.
07.04 Analyze AC circuits using network theorems.
07.05 Solve problems in transient analysis in RC and RL circuits.
07.06 Demonstrate and analyze the effects of loading on transformers.
07.07 Analyze RLC circuits using complex numbers.
07.08 Design, construct, and analyze RC/RCL filters.
07.09 Analyze AC circuits using computer programs.

08.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF ROTATING MACHINERY--The student will be able to:

08.01 Identify and define the characteristics of DC, series, shunt, compound motors, and generators.
08.02 Identify and define the characteristics of AC, single phase, and polyphase motors.
08.03 Set up and operate DC and AC motors.

09.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF POWER GENERATION SYSTEMS--The student will be able to:

09.01 Identify the elements of a power generation system.
09.02 Solve problems involving alternators.

10.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF POWER TRANSFORMERS--The student will be able to:

10.01 Identify the characteristics of power transformers.
10.02 Solve problems involving the application of power transformers.

11.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF POWER TRANSMISSION SYSTEMS--The student will be able to:

11.01 Identify power transmission lines.
11.02 Solve problems involving transmission lines.

12.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF POWER DISTRIBUTION SYSTEMS--The student will be able to:

12.01 Identify power distribution systems.
12.02 Solve problems involving distribution systems.

13.0 DEMONSTRATE PROFICIENCY IN PRINCIPLES OF SWITCHGEAR, MOTOR CONTROL CENTERS, AND AC BREAKER PANELS--The student will be able to:

13.01 Identify the properties of switchgears.
13.02 Describe the operation of switchgear, motor control centers, and AC breaker panels.

14.0 DEMONSTRATE PROFICIENCY IN INTERPRETATION OF ELECTRIC CODES.--The student will be able to:

14.01 Understand the need for the IEEE (Institute of Electrical, Electronics and Engineers), NEMA (National Electrical Manufacturers Association) and ANSI (American National Standards Institute) codes.
14.02 Demonstrate proficiency in interpretation/explanation of the IEEE (Institute of Electrical, Electronics and Engineers), NEMA (National Electrical Manufacturers Association) and ANSI (American National Standards Institute) codes.

15.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS. The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

Intended Outcomes for GENERATION OPTION:

17.0 DEMONSTRATE PROFICIENCY IN GENERATORS, EXCITERS, AND VOLTAGE REGULATORS--The student will be able to:

17.01 Demonstrate proficiency in the principals of generators.
17.02 Identify the magnetic field associated with a generator.
17.03 Identify positive and negative rotation.
17.04 Identify the purpose and function of a generator or field ground circuit.
17.05 Identify the different methods of excitation.
17.06 Identify the most common parameters of a generator.
17.07 Identify each component of the generator, how they interrelate and their individual function.

18.0 DEMONSTRATE PROFICIENCY IN TRANSFORMERS--The student will be able to:

18.01 Demonstrate proficiency in the principles of transformers including the autotransformer.
18.02 Identify the magnetic fields associated with a transformer.
18.03 Identify the characteristics of a power transformer.
18.04 Identify and make proper single phase transformer connections.
18.05 Identify and make proper three phase (delta, WYE) transformer connections.
18.06 Make proper tap changes.
18.07 Analyze the ideal circuit model of a transformer.
18.08 Identify and analyze transformer nomenclature, polarity, name plate data and ratings.
18.09 Identify and analyze transformer losses and efficiency.
18.10 Perform basic maintenance procedures and testing including oil testing and ratio test phasing.
18.11 Locate and correct fault currents.

19.0 DEMONSTRATE PROFICIENCY IN SWITCHGEAR, MOTOR CONTROL CENTERS, BREAKER PANELS, AND AC AND DC PLANT POWER DISTRIBUTION--The student will be able to:

19.01 Demonstrate proficiency in the various classifications and components of switchgear, motor control centers, and distribution breaker panels.
19.02 Demonstrate knowledge in the standards that govern the application of switchgear, motor control centers, and breaker panel (NEMA standards, IEEE National Electric Code).
19.03 Demonstrate knowledge in fault current calculations equipment rational (continuous, interrupt, and with standard capabilities).
19.04 Demonstrate knowledge of insulation test materials and the application of various test equipment (Megger, hi-pot, Doble).
19.05 Demonstrate knowledge in cable entry and termination. This includes power cable, control cable, shield terminations, current transformer, and potential transformer locations and wiring ratings.
19.06 Demonstrate knowledge in plant one line electrical diagram configurations and various distribution systems to include auxiliary power systems, reserve power systems, DC power systems, automatic power systems and automatic transfer systems.
19.07 Demonstrate the application of plant one line electrical diagram configurations and various distribution systems to include auxiliary power systems, reserve power systems, DC power systems, automatic power systems and automatic transfer systems.
19.08 Identify the characteristics of fused panels and breaker panels.
19.09 Demonstrate knowledge and use (application) of ground bus, neutral bus, and grounded neutral bus.
19.10 Demonstrate proficiency in plant DC power distribution systems to include batteries (inverters and troubleshooting techniques).

20.0 DEMONSTRATE PROFICIENCY IN PROTECTIVE DEVICES--The student will be able

to:

20.01 Demonstrate knowledge of what a protective devise is for motors, generators, transformers and switchgear and why they are necessary.
20.02 Demonstrate proficiency in understanding the IEEE standard device numbering system.
20.03 Demonstrate knowledge in various categories of protective devices and their coordination (overcurrent, differential, etc.).
20.04 Perform an acceptance test on a breaker, fuse, and overcurrent relay.
20.05 Demonstrate proficiency in selecting the correct protective device and its rating for a motor, cable and lighting load.
20.06 Know of potential transformers, current transformers and their application in metering and protection circuits.

21.0 DEMONSTRATE PROFICIENCY IN POWER CABLE, CONTROL CABLE, INSTRUMENTATION CABLE AND RACEWAYS--The student will be able to:

21.01 Demonstrate proficiency in how power cables, control cables and instrumentation cables are constructed.
21.02 Demonstrate proficiency in the standard voltage ratings of power cables, control cables and instrumentation cables.
21.03 Demonstrate proficiency in the standard current ratings of power cables and control cables.
21.04 Demonstrate proficiency in power cable (a) effects of heat (internal and external) on the ampacity rating of a cable. (b) magnetic effects between conductors, (c) knowledge of when the ground shields are necessary and how to terminate them, (d) methods of installing power cables in conduits, trays, and ductbanks (pulling cables, single and multiple groups) and (e) selecting terminating materials and how they are used.
21.05 Demonstrate proficiency in control cable (a)identification codes of different conductors within a control cable, (b) knowledge in selecting terminating materials and equipment, (c) termination of a control circuit and perform the actual termination, and (d) proper installation methods (pulling cable, single and multiple groups).
21.06 Demonstrate proficiency in instrumentation cable (a) the different metals used to make conductors for instrumentation cables, (b) the effects of large power circuits in close proximity to instrumentation cables, (c) how and why shields are included in instrumentation cables, (d) proper methods of installing instrumentation cables in conduits, trays and ductbanks, (e) knowledge on when to extend ground shield, terminate a ground shield, and the methods used, (f) how to terminate a thermocouple cable and make actual installation, (g) knowledge of the standard conductor identification methods, and (h) differences between thermocouple extension cable.

22.0 DEMONSTRATE PROFICIENCY IN GROUNDING--The student will be able to:

22.01 Explain why grounding is necessary.
22.02 Demonstrate knowledge in how ground circuits are necessary for the interruptions of protective devices.
22.03 Demonstrate knowledge in how ground systems protect individuals from shocks.
22.04 Demonstrate proficiency in layout, installing, and sizing ground conductors.
22.05 Demonstrate proficiency in the magnetic effects of phase conductors and ground conductors.
22.06 Demonstrate proficiency in the identification of grounding

conductors.
22.07 Demonstrate the principals of point source grounding and maintaining it.
22.08 Demonstrate proficiency in ground systems effectiveness.

23.0 DEMONSTRATE PROFICIENCY IN MOTORS--The student will be able to:

23.01 Identify the characteristics needed to properly select a motor for replacement or a new application.
23.02 Demonstrate knowledge of the NEMA Standards MG1 and MG2.
23.03 Identify and test a DC motor for receiving criteria.
23.04 Identify and test a AC motor for receiving criteria.
23.05 Demonstrate proficiency in establishing a motor direction of rotation and changing it. Applicable to AC single phase, AC three phase, DC motors.
23.06 Demonstrate proficiency in the various methods of starting AC and DC motors.
23.07 Demonstrate proficiency in motor control circuits by developing the logic and wiring a control circuit.
23.08 Demonstrate proficiency in control and application of 3 phase synchronize motors.

24.0 DEMONSTRATE PROFICIENCY IN THE PLANT CYCLE (Both I & C and Electric)--The student will be able to:

24.01 Identify and define the basic elements of the basic steam cycle.
24.02 Describe major plant components, such as: boilers, turbine, generators, pollution control equipment, heat exchangers, pumps, etc.
24.03 Demonstrate proficiency in reading and using steam tables, basic heat rate calculations (feed water heater performance).

25.0 DEMONSTRATE PROFICIENCY IN ELECTRIC MOTORS--The student will be able to:

25.01 Read, interpret and troubleshoot from elementary diagrams.
25.02 Demonstrate competency in the elements of the elementary diagrams (relays, timers, limit switches, selector switches).

Intended Outcomes for INSTRUMENTATION and CONTROL OPTION:

26.0 DEMONSTRATE PROFICIENCY IN THE PLANT CYCLE (BOTH I & C AND ELECTRIC)--The student will be able to:

26.01 Identify and define the basic elements of the basic steam cycle.
26.02 To describe major plant components, such as: boilers, turbine, generators, pollution control equipment, heat exchangers, pumps, etc.
26.03 Demonstrate proficiency in reading and using steam tables, basic heat rate calculations (feed water heater performance).

27.0 DEMONSTRATE PROFICIENCY IN PRIMARY ELEMENTS AND TRANSMITTERS--The student will be able to:

27.01 Define physical properties relating to pressure, level, temperature, ph, conductivity, vibration, and flow.
27.02 Identify the types and appropriate application of primary elements used in measuring those physical properties.
27.03 Operate basic test equipment (deadweight tester, vacuum pump, potentiometer, thermal bath).
27.04 Setup, calculate and measure the output of primary elements and transmitters under varying conditions.
27.05 Identify and define the operating characteristics of electric and

pneumatic transmitters.
27.06 Specify appropriate primary elements and transmitters for basic process measurements (e.g., case ratings, ranges accuracy, basic data sheets, ISA standards).
27.07 Calibrate and troubleshoot transmitters.
27.08 Design, setup and test pneumatic and electronics instrument loops.

28.0 DEMONSTRATE PROFICIENCY IN FINAL ELEMENTS--The student will be able to:

28.01 Define operating characteristics and appropriate applications for control valves (valve sizing calculations, flashing, covitation, types (plug, globe, ball, butterfly) action (linear, quick opening, equal percentage).
28.02 Define operating characteristics for dampers (relationship between driver & flow; cams, types (e.g. guillotine, louver)).
28.03 Define the operating characteristics of valve/damper operator: pneumatic, hydraulic, electric and interface devices: SOV's, positioners, I/Ps.
28.04 Calibrate and troubleshoot final elements and interface devices.
28.05 Design, setup and test instrument loop with final element.

29.0 DEMONSTRATE PROFICIENCY IN PROCESS CONTROL--The student will be able to:

29.01 Identify and define the elements of automatic control (integral, derivative, proportional, direct acting, feed forward, ration, cascade, three element feedwater control etc.).
29.02 Analyze and test tuning constant relationships (example: define the output of a process with a set or ramp change using a proportional plus derivative action controller).
29.03 Read, interpret basic functional diagrams.

30.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

30.01 Identify CPU (Architecture) building blocks and their uses.
30.02 Analyze BUS concepts.
30.03 Analyze various memory schemes.
30.04 Use memory devices in circuits.
30.05 Troubleshoot memory-device circuits.
30.06 Set up and operate oscilloscopes for microprocessor systems.
30.07 Set up and operate logic/data analyzers for troubleshooting microprocessor systems.
30.08 Identify types of input and output devices and peripherals.
30.09 Interface input and output ports to peripherals.
30.10 Analyze and troubleshoot input an output ports.
30.11 Specify, program and troubleshoot programmable logic controllers.
30.12 Analyze and troubleshoot a communications link.
30.13 Configure and troubleshoot distributed digital controllers.

31.0 DEMONSTRATE PROFICIENCY IN COMBUSTION CONTROL--The student will be able to:

31.01 Demonstrate competence in the following: steam flow - air flow relationship steam flow - fuel flow relationship fuel flow - air flow relationship excess oxygen steam flow - air flow - fuel flow relationship
31.02 Demonstrate competence in drum level control.
31.03 Define critical protection systems such as implosion protection, burner management systems.
31.04 Read, interpret, and troubleshoot from functional diagrams.

32.0 DEMONSTRATE PROFICIENCY IN ELECTRIC MOTOR CONTROL--The student will be

able to:

32.01 Read, interpret and troubleshoot from elementary diagrams.
32.02 Demonstrate competency in the elements of the elementary diagrams (relays, timers, limit switches, selector switches).

33.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

33.01 Define and apply numbering systems to codes and arithmetic operations.
33.02 Analyze/minimize logic circuits using Boolean operations.
33.03 Setup and operate logic probes for digital circuits.
33.04 Setup and operate power supplies for digital circuits and solve power distribution and noise problems.
33.05 Set up and operate pulsars for digital circuits.
33.06 Set up and operate oscilloscopes for digital circuits.
33.07 Set up and operate logic analyzers for digital circuits.
33.08 Set up and operate pulse generators for digital circuits.
33.09 Identify types of logic gates and their truth tables.
33.10 Construct combinational logic circuits using integrated circuits.
33.11 Troubleshoot logic circuits.
33.12 Analyze types of flip-flops and their truth tables.
33.13 Construct flip-flops using integrated circuits.
33.14 Troubleshoot flip-flops.
33.15 Identify, define and measure characteristics if integrated circuit (IC) logic families.
33.16 Identify types of registers and counters.
33.17 Construct registers and counters using flip-flops and logic gates.
33.18 Troubleshoot registers and counters.
33.19 Analyze clock and timing circuits.
33.20 Construct clock and timing circuits.
33.21 Troubleshoot clock and timing circuits.
33.22 Identify types of arithmetic-logic circuits.
33.23 Construct arithmetic-logic circuits.
33.24 Troubleshoot arithmetic-logic circuits.
33.25 Identify types of encoding and decoding devices.
33.26 Construct encoders and decoders.
33.27 Troubleshoot encoders and decoders.
33.28 Identify types of multiplexers and demultiplexer circuits.
33.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
33.30 Troubleshoot multiplexer and demultiplexer circuits.
33.31 Identify types of memory circuits.
33.32 Relate the uses of digital-to-analog and analog-to-digital circuits.
33.33 Construct digital-to-analog and analog-to-digital circuits.
33.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
33.35 Identify types of digital displays.
33.36 Construct digital display circuits.
33.37 Troubleshoot digital display circuits.

Intended Outcomes for DISTRIBUTION OPTION:

34.0 DEMONSTRATE PROFICIENCY IN THE APPLICATION OF POWER TRANSFORMERS--The student will be able to:

34.01 Demonstrate proficiency in the principles of transformers including the autotransformer.
34.02 Identify the magnetic fields associated with a transformer.
34.03 Identify the characteristics of a power transformer.
34.04 Identify and make proper single phase transformer connections.

34.05 Identify and make proper three phase (delta, WYE) transformer connections.
34.06 Make proper load tap changes.
34.07 Analyze the ideal circuit model of a transformer.
34.08 Identify and analyze transformer nomenclature, polarity, name plate data and ratings.
34.09 Identify and analyze transformer losses and efficiency.
34.10 Perform basic maintenance procedures and testing including oil testing and ratio test phasing.
34.11 Locate and correct fault currents.

35.0 DEMONSTRATE PROFICIENCY IN THE USE OF ELECTRICAL EQUIPMENT--The student will be able to:

35.01 Identify and troubleshoot circuit breakers and reclosers in transmission and distribution systems.
35.02 Identify and analyze the use of conductors (overhead and underground) in transmission and distribution systems.
35.03 Identify the characteristics and uses of poles, wood, concrete and aluminum.
35.04 Identify the types of wood treatments for poles.
35.05 Identify and analyze the use of capacitors, insulators, regulators and arresters.
35.06 Design and analyze guying and anchor systems.
35.07 Make high voltage connections.
35.08 Identify load management devices.
35.09 identify and analyze the use of switches and switchgear.
35.10 Identify and analyze the use of conduit and panel guards.
35.11 Set up and operate instrument transformers PT and CT.
35.12 Identify and analyze, metering systems.
35.13 Identify and analyze lighting systems.

36.0 DEMONSTRATE PROFICIENCY IN THE PRINCIPLES OF SYSTEM PROTECTION--The student will be able to:

36.01 Identify and analyze the sue of feeder breaker recloser and fuses.
36.02 Identify and define the characteristics of a substation.
36.03 Design, identify and analyze motor projection devices.
36.04 Identify and analyze over current and over voltage protection.

37.0 DEMONSTRATE PROFICIENCY IN 3 PHASE POWER SYSTEM ANALYSIS--The student will be able to:

37.01 Covert between physical units (amperes, volts, ohms, watts, and VARS and per unit parameters).
37.02 Analyze radial distribution systems (compute line and phase, voltages, currents and power flows).
37.03 Analyze 3 phase systems on a single phase basis (assume balanced systems).
37.04 Analyze the loading, voltage drops, balance and circuit balance of a 3 phase system.

38.0 DEMONSTRATE PROFICIENCY IN DISTRIBUTION CIRCUIT DESIGN--The student will be able to:

38.01 Define and apply the general principles of surveying.
38.02 Be proficient in the use of and application of survey equipment.
38.03 Identify easements and analyze legal descriptions.

39.0 DEMONSTRATE PROFICIENCY IN BASIC SURVEYING SKILLS--The student will be able to:

39.01 Design basic overhead and underground single and 3 phase line extensions.
39.02 Demonstrate an understanding of fuse and breaker coordination.
39.03 Demonstrate an understanding of the "per unit" system of calculations.
39.04 Demonstrate an understanding of grounded and ungrounded systems.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electrical/Electronics Drafting

CODE NUMBER: Secondary _______ Postsecondary I480104

Florida CIP 0648.010400

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ____7-9 ____9-12 _x_Postsecondary Adult Vocational

______ Postsecondary Vocational _x_ Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230), electrical drafters (003.281-010) or electronic drafters (003.281-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, mathematical skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the development of working drawings and wiring diagrams used by construction crews and repairers to install and repair electrical equipment, power plants, industrial establishments and commercial or domestic buildings, and development of wiring and schematic diagrams and layout drawings used to manufacture assemble, install and repair electrical and electronic equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting room procedures; operating blueprint machine and other duplicating equipment; use of technical manuals and other reference materials; use of light table; use of accessories; computer assisted drawing; materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is one of many appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Completion of the 900 hour core Drafting program is a prerequisite for entry into this postsecondary specialization program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade

level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be warded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare electrical/electronic drawings.
02. Prepare electrical drawings.
03. Prepare electronic drawings.
04. Prepare advanced computer-aided drawings.
05. Demonstrate appropriate communication skills.
06. Demonstrate appropriate math skills.
07. Demonstrate appropriate understanding of basic science.
08. Demonstrate employability skills.
09. Demonstrate appropriate understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Electrical/Electronics Drafting
POSTSECONDARY NUMBER: I480104

01.0 PREPARE ELECTRICAL/ELECTRONIC DRAWINGS--The student will be able to:

01.01 Prepare schematic drawings.
01.02 Prepare printed circuit board drawings.
01.03 Prepare package drawings.

02.0 PREPARE ELECTRICAL DRAWINGS--The student will be able to:

02.01 Apply the basic theory of electricity.
02.02 Apply the basic theory of circuitry.
02.03 Use electrical symbols.
02.04 Prepare single-line block diagrams.
02.05 Prepare a panel board schedule.

03.0 PREPARE ELECTRONIC DRAWINGS--The student will be able to:

03.01 Identify electronic device symbols.
03.02 Prepare schematic drawings.
03.03 Prepare printed circuit board drawings.
03.04 Prepare package drawings.
03.05 Prepare connection drawings.
03.06 Prepare interconnection drawings.
03.07 Prepare wiring lists.
03.08 Prepare cable drawings.
03.09 Prepare harness drawings.
03.10 Prepare component drawings.
03.11 Prepare logic diagrams.
03.12 Design an electromechanical unit.

04.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

04.01 Prepare schematic drawings.
04.02 Prepare electrical drawings.
04.03 Prepare electrical drawings.
04.04 Prepare electromechanical drawings.

05.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

05.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
05.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
05.03 Read and follow written and oral instructions.
05.04 Answer and ask questions coherently and concisely.
05.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
05.06 Demonstrate appropriate telephone/communication skills.

06.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

06.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
06.02 Measure tolerance(s) on horizontal and vertical surfaces using

millimeters, centimeters, feet and inches.
06.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
06.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
06.05 Demonstrate an understanding of federal, state and local taxes and their computation.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

07.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
07.02 Draw conclusions or make inferences from data.
07.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
07.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.
08.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
08.11 Identify or demonstrate acceptable personal grooming habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.
09.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK
FLORIDA DEPARTMENT OF EDUCATION
PROGRAM TITLE: Electromechanical Technology
CODE NUMBER: Secondary ________
Florida CIP 0615.040300

PROGRAM AREA: Industrial
EFFECTIVE DATE: July, 1993
Postsecondary I150403

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 __x__ Postsecondary Adult Vocational

___ Postsecondary Vocational _x_ Other 30, 31

CERTIFICATION COVERAGE: TEC MECH @ 7 G TEC ELEC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electronic precision assemblers (93114859), electromechanical technicians (710.281-018). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to the following: operation, maintenance and repair of electrical motors and control panels, hydraulic systems, pneumatic systems, laser electro-optic systems, mechanical drives and conveyor systems, computers, communications equipment and robotic systems.

The course content should also include training in communication, leadership, human relations, employability skills, and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing electromechanical equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is

recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 960 hours in addition to completion of Electronics Technology which is the appropriate common core.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in electronic and mechanical blueprint reading.
02. Demonstrate proficiency in electronic communications circuits.
03. Demonstrate proficiency in advanced microprocessors.
04. Demonstrate proficiency in computer software applications.
05. Demonstrate proficiency in motors and motor control circuits.
06. Demonstrate proficiency in laser electro-optics.
07. Demonstrate proficiency in hydraulic and pneumatic systems.
08. Demonstrate proficiency in mechanical power transmission systems.
09. Demonstrate proficiency in mechanisms, linkages and levers.
10. Demonstrate proficiency in transducers and instrumentation.
11. Demonstrate proficiency in video systems.
12. Demonstrate proficiency in statics and industrial materials.
13. Demonstrate proficiency in automatic controls and robotics.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Electromechanical Technology POSTSECONDARY NUMBER: I150403

01.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC AND MECHANICAL BLUEPRINT READING--The student will be able to:

01.01 Describe types of blueprints and their applications.
01.02 Read drawings and transfer measurements.
01.03 Identify, use and understand application of auxiliary views, revolutions, sectional views and orthographic projections.
01.04 Apply dimensioning practices and techniques to drawings.
01.05 Apply x-y coordinate dimensioning.
01.06 Apply geometric dimensioning and tolerancing procedures.
01.07 Identify symbols used to represent materials and standard fits.
01.08 Interpret mechanical production blueprints and assembly drawings.
01.09 Trace a circuit through a multilayer board.

02.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC COMMUNICATIONS CIRCUIT--The student will be able to:

02.01 Construct and analyze Amplitude Modulated (AM) circuits.
02.02 Construct and analyze Frequency Modulated (FM) circuits.
02.03 Define radio propagation, antennas and transmission lines.

03.0 DEMONSTRATE PROFICIENCY IN ADVANCED MICROPROCESSORS--The student will be able to:

03.01 Identify the characteristics and functions of advanced microprocessor chips.
03.02 Analyze programs for advanced microprocessors using machine languages.
03.03 Identify diagnostic troubleshooting equipment on advanced microprocessor systems.
03.04 Describe the operation and applications of synchronous and asynchronous devices, interface adapters and timer modules.
03.05 Analyze the basic architecture of a typical microcomputer system, and describe the types of input and output storage methods used.
03.06 Analyze and program MPU's (Micro Processing Unit) using subroutines and interrupts.
03.07 Interface advanced peripheral devices.
03.08 Describe the operation of data communications systems.
03.09 Identify the components of data communications systems.
03.10 Describe and define data communication codes, formats and protocols.
03.11 Identify serial and parallel ports and explain their use.
03.12 Set up and operate modems.
03.13 Analyze and troubleshoot basic modems.
03.14 Identify and describe types of carrier systems.
03.15 Interconnect systems using the RS-232, RS-422 and IEEE488 interface standards.
03.16 Identify and define base band and broad band local area networks.

04.0 DEMONSTRATE PROFICIENCY IN COMPUTER SOFTWARE APPLICATIONS--The student will be able to:

04.01 Identify the major types of industrial software languages currently in use.
04.02 Load and run various types of software programs in a micro

computer.
04.03 Utilize diagnostic software to troubleshoot malfunctions.
04.04 Identify and utilize various software packages.
04.05 Execute applicable software packages.

05.0 DEMONSTRATE PROFICIENCY IN MOTORS AND MOTOR CONTROL CIRCUITS--The student will be able to:

05.01 Identify and locate reference documents for the National Electric Code and other electrical standards.
05.02 Identify types of relays and describe their operation and applications.
05.03 Identify types of electric motors and describe their operation and applications of protection circuits.
05.04 Identify types of transformers and describe their operation and applications.
05.05 Identify types of motor controllers and describe their operation and applications.
05.06 Interpret relay ladder logic diagrams.
05.07 Construct manual motor starting and reversing circuits.
05.08 Construct magnetic motor starting and reversing circuits.
05.09 Construct and troubleshoot relay logic circuits.
05.10 Identify the basic elements of solid state motor control.
05.11 Analyze and construct basic transformer configurations.
05.12 Analyze and troubleshoot variable frequency drives and synchronous systems.
05.13 Analyze and troubleshoot brushless DC motor controls.
05.14 Construct and troubleshoot timing control circuits.
05.15 Identify power distribution systems.
05.16 Analyze and construct photoelectric and proximity sensor circuits.
05.17 Identify, analyze and program programmable logic controllers (PLC).

06.0 DEMONSTRATE PROFICIENCY IN LASER ELECTRO-OPTICS--The student will be able to:

06.01 Identify safety hazards and regulations of laser applications.
06.02 Define, calculate and measure the properties of laser light.
06.03 Define the elements of a basic lasing system.
06.04 Identify and define types and classes of lasers.
06.05 Define the fundamental laws of optics.
06.06 Identify and define the function of laser accessories.
06.07 Analyze and define common laser applications.
06.08 Analyze and measure laser outputs.
06.09 Align and adjust laser systems for specific outputs.
06.10 Define the use of electro-optic modulators and mechanical beam deflectors.
06.11 Measure the characteristics of electro-optic emitters and detectors.
06.12 Identify electro-optic principles.
06.13 Construct circuits for electro-optic light sources.
06.14 Construct and troubleshoot electro-optic display circuits.
06.15 Construct circuits for light reactive devices.
06.16 Measure light transmission through fiber optic devices.

07.0 DEMONSTRATE PROFICIENCY IN HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

07.01 Identify the components of hydraulic systems and describe their functions.
07.02 Construct and troubleshoot basic hydraulic circuits.

07.03 Identify hydraulic symbols, components and types of fluids.
07.04 Construct and troubleshoot hydraulic circuits using flow control valves, pressure valves and sequence valves.
07.05 Construct and troubleshoot hydraulic circuits using directional and slow control valves.
07.06 Analyze, construct and troubleshoot hydraulic circuits that utilize actuator speed control and counter balance devices.
07.07 Construct and troubleshoot hydraulic circuits using reducing and unloading valves.
07.08 Construct and troubleshoot hydraulic circuits using accumulators.
07.09 Construct and troubleshoot a regenerative hydraulic circuit and a hydraulic circuit using remote control.
07.10 Construct and troubleshoot hydraulic circuits for deceleration and braking.
07.11 Identify the components of pneumatic systems and describe their functions.
07.12 Troubleshoot and repair pneumatic valves, compressors, pumps and regulators.
07.13 Analyze and define gas pressure storage and force in basic pneumatic circuits.
07.14 Construct and troubleshoot pneumatic circuits and systems.

08.0 DEMONSTRATE PROFICIENCY IN MECHANICAL POWER TRANSMISSION SYSTEMS--The student will be able to:

08.01 Utilize precision measuring instruments.
08.02 Construct and align mechanisms to demonstrate displacement, velocity and torque ratios.
08.03 Identify, analyze and repair compound and reverted gear trains.
08.04 Identify, analyze and repair internal and planetary gear trains.
08.05 Identify, analyze and repair helical and bevel gear trains.
08.06 Identify, analyze and repair rack and pinion, worm and wheel and block and screw mechanisms.
08.07 Identify, analyze and repair counter rotating mechanisms and differentials.
08.08 Identify, analyze and repair spring mechanisms, pulley blocks and differential hoists.
08.09 Identify, analyze and repair chain, belt and disc drives and universal joints.
08.10 Identify, analyze and repair clutch and coupling mechanisms.
08.11 Identify, analyze and repair bushings and cams.
08.12 Apply proper lubrication to mechanical system components.

09.0 DEMONSTRATE PROFICIENCY IN MECHANISMS, LINKAGES AND LEVERS--The student will be able to:

09.01 Identify, analyze and repair clutch and brake mechanisms.
09.02 Identify, analyze and repair class one, two, three and compound levers.
09.03 Identify, analyze and repair rocker arm and bell crank linkages and combined mechanisms.
09.04 Identify, analyze and repair four-bar mechanisms (crank, rocker and double rocker).
09.05 Identify, analyze and repair drag link and intermediate mechanisms.
09.06 Identify, analyze and repair four-bar variations.
09.07 Identify, analyze and repair cam mechanisms.
09.08 Identify, analyze and repair pivoted follower mechanisms.
09.09 Identify, analyze and repair toggle, quick return and ratchet mechanisms.
09.10 Identify, analyze and repair harmonic drives.
09.11 Identify, analyze and repair geneva mechanisms.

10.0 DEMONSTRATE PROFICIENCY IN TRANSDUCERS AND INSTRUMENTATION--The student will be able to:

10.01 Measure fluid flow and liquid levels with transducer circuits.
10.02 Utilize operational amplifier circuits for transducer applications.
10.03 Construct and utilize circuits for thermal sensing devices.
10.04 Set up and test strain gage circuits.
10.05 Utilize pressure transducers to monitor hydraulic and pneumatic circuits.
10.06 Utilize acceleration transducers.
10.07 Utilize positional transducers.
10.08 Construct and troubleshoot circuits for sound transducers.
10.09 Set up and operate transducer recording devices.

11.0 DEMONSTRATE PROFICIENCY IN VIDEO SYSTEMS--The student will be able to:

11.01 Define the principles of video signal generation and video graphics.
11.02 Analyze and troubleshoot monitor power supplies.
11.03 Analyze and troubleshoot sweep circuits.
11.04 Analyze and troubleshoot high voltage circuits.
11.05 Analyze and troubleshoot video circuits.
11.06 Analyze and troubleshoot sync circuits.
11.07 Align color monitors for proper operation.
11.08 Analyze and troubleshoot video monitor sound circuits.
11.09 Analyze and troubleshoot color circuits.
11.10 Interconnect video system components using coaxial cables.

12.0 DEMONSTRATE PROFICIENCY IN STATICS AND INDUSTRIAL MATERIALS--The student will be able to:

12.01 Define and measure forces and loads in structures using a ring force transducer.
12.02 Define and analyze force systems acting on beams.
12.03 Define and measure the mechanical properties, tensile strength, modules of elasticity and hardness of materials.
12.04 Define and measure the effects of heat treating and aging on the properties of materials (Rockwell, Brinell, tensile testing).
12.05 Identify the effects of corrosion and electroplating on materials.
12.06 Define the properties of plastic materials.

13.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC CONTROLS AND ROBOTICS--The student will be able to:

13.01 Utilize complex motor control circuits including variable frequency drives.
13.02 Analyze and interpret complex ladder diagrams.
13.03 Analyze the operation of programmable controllers in robotic systems.
13.04 Develop programs for programmable controllers in an automated work cell.
13.05 Specify and utilize various sensor devices.
13.06 Analyze the operation of robotic work cells and support equipment.
13.07 Analyze and troubleshoot specific robot systems.
13.08 Analyze and implement robotic software programs, and explain pendant operations.
13.09 Interface robot systems with other automatic equipment.
13.10 Troubleshoot and repair automation control systems.
13.11 Identify and analyze various robotic motor systems.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electronic System Assembly

CODE NUMBER: Secondary 8730300 Postsecondary I470129

Florida CIP 0647.019903

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: 9 - 12, 30, 31 - ELECTRONIC @ 7 G
30, 31 - ELECTRONIC @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electronic precision assemblers (93114859), electronic chassis assemblers (726.384-010), electronic wirers (726.687-010), encapsulators (726.684-030), solderers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading, selection and use of tools/materials, wire preparation for soldering, soldering skills, types of circuit boards, types of terminals, types of solder cups, component assembly, and solderless connections.

Listed below are the courses that comprise this program when offered at the secondary level:

8730310 Electronic System Assembly 1
8730320 Electronic System Assembly 2
8730330 Electronic System Assembly 3

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in electronic chassis assembly. The tools, materials and processes used in the laboratory should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Interpret written, graphic and/or oral instruction.
02. Develop basic electronic assembly skills.
03. Prepare wire for soldering and/or assembly.
04. Apply soldering techniques.
05. Connect component and lead wires.
06. Install electronic component assembly.
07. Prepare material for solderless connections.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8730300

PROGRAM TITLE: Electronic System Assembly POSTSECONDARY NUMBER: I470129

01.0 INTERPRET WRITTEN, GRAPHIC AND/OR ORAL INSTRUCTION--The student will be able to:

01.01 Read and interpret written and oral instructions.
01.02 Read and interpret graphic instructions.
01.03 Follow accepted safety rules.
01.04 Read and interpret electronic chassis assembly.
01.05 Read and interpret color coding.

02.0 DEVELOP BASIC ELECTRONIC ASSEMBLY SKILLS--The student will be able to:

02.01 Use hand tools.
02.02 Use mechanical and other strippers.
02.03 Use soldering irons.
02.04 Select soldering materials.
02.05 Select types of wire.
02.06 Identify and select electronic component parts.
02.07 Select types of terminals.
02.08 Select types of cleaning tools and materials.
02.09 Use desoldering tools.

03.0 PREPARE WIRE FOR SOLDERING AND/OR ASSEMBLY--The student will be able to:

03.01 Strip wires for soldering.
03.02 Tin by hand and/or solder pot.

04.0 APPLY SOLDERING TECHNIQUES--The student will be able to:

04.01 Apply heat applications.
04.02 Apply solder applications.
04.03 Rework unsatisfactory connectors.
04.04 Maintain solder connection appearance.

05.0 CONNECT COMPONENT AND LEAD WIRES--The student will be able to:

05.01 Solder component leads to printed circuit boards.
05.02 Solder component lead wires to turret terminals.
05.03 Solder lead wires to bifurcated terminals.
05.04 Solder lead wires to hook and perforated terminals.
05.05 Solder lead wires into connector solder cups.

06.0 INSTALL ELECTRONIC COMPONENT ASSEMBLY--The student will be able to:

06.01 Mount components onto a chassis.
06.02 Mount components onto a panel.
06.03 Mount components onto a circuit board.

07.0 PREPARE MATERIALS FOR SOLDERLESS CONNECTIONS--The student will be able to:

07.01 Prepare wire for cables.
07.02 Strip, terminalize, lay and lace harness.
07.03 Use heat shrinkable tubing.
07.04 Strip wires for wrapping.
07.05 Route and wrap for pin connections.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.

12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Electronic System Assembly
PROGRAM NUMBER: 8730300
COURSE TITLE: Electronic System Assembly 1
COURSE NUMBER: 8730310

COURSE DESCRIPTION:

This course includes instruction in basic electronics and interpreting instructions.

01.0 INTERPRET WRITTEN, GRAPHIC AND/OR ORAL INSTRUCTION--The student will be able to:

01.01 Read and interpret written and oral instructions.
01.02 Read and interpret graphic instructions.
01.03 Follow accepted safety rules.
01.04 Read and interpret electronic chassis assembly.
01.05 Read and interpret color coding.

02.0 DEVELOP BASIC ELECTRONIC ASSEMBLY SKILLS--The student will be able to:

02.01 Use hand tools.
02.02 Use mechanical and other strippers.
02.03 Use soldering irons.
02.04 Select soldering materials.
02.05 Select types of wire.
02.06 Identify and select electronic component parts.
02.07 Select types of terminals.
02.08 Select types of cleaning tools and materials.
02.09 Use desoldering tools.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Electronic System Assembly
PROGRAM NUMBER: 8730300
COURSE TITLE: Electronic System Assembly 2
COURSE NUMBER: 8730320

COURSE DESCRIPTION:

This course includes instruction in wire soldering, soldering techniques and connecting lead wires.

03.0 PREPARE WIRE FOR SOLDERING AND/OR ASSEMBLY--The student will be able to:

03.01 Strip wires for soldering.
03.02 Tin by hand and/or solder pot.

04.0 APPLY SOLDERING TECHNIQUES--The student will be able to:

04.01 Apply heat applications.
04.02 Apply solder applications.
04.03 Rework unsatisfactory connectors.
04.04 Maintain solder connection appearance.

05.0 CONNECT COMPONENT AND LEAD WIRES--The student will be able to:

05.01 Solder component leads to printed circuit boards.
05.02 Solder component lead wires to turret terminals.
05.03 Solder lead wires to bifurcated terminals.
05.04 Solder lead wires to hook and perforated terminals.
05.05 Solder lead wires into connector solder cups.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Electronic System Assembly

PROGRAM NUMBER: 8730300

COURSE TITLE: Electronic System Assembly 3

COURSE NUMBER: 8730330

COURSE DESCRIPTION:

This course includes instruction in installation of electronic components, and making solderless connections.

06.0 INSTALL ELECTRONIC COMPONENT ASSEMBLY--The student will be able to:

06.01 Mount components onto a chassis.
06.02 Mount components onto a panel.
06.03 Mount components onto a circuit board.

07.0 PREPARE MATERIALS FOR SOLDERLESS CONNECTIONS--The student will be able to:

07.01 Prepare wire for cables.
07.02 Strip, terminalize, lay and lace harness.
07.03 Use heat shrinkable tubing.
07.04 Strip wires for wrapping.
07.05 Route and wrap for pin connections.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electronic Technology

CODE NUMBER: Secondary _______ Postsecondary I150303

Florida CIP 0615.030300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ELECTRONIC @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as electrical and electronics technicians (22505222), (003.161-014) or in related occupations in electronics, or to provide supplemental training to persons currently or previously employed in the occupation.

This program is the Florida common core electronics program.

Course content includes the following: direct current (DC) circuits, alternating current (AC) circuits and analog circuits; solid state and digital devices; microprocessors; use of circuit diagrams and schematics; soldering and chassis assembly techniques; laboratory practices; and technical recording and reporting.

The course content also includes training in communication, leadership, human relations, employability skills, and safe efficient work practices.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing electronic circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for

each student: a training plan signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 to 1400 hours.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor systems.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Electronic Technology POSTSECONDARY NUMBER: I150303

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering techniques.
01.06 Demonstrate acceptable desoldering techniques.
01.07 Demonstrate electrostatic discharge (ESD) safety procedures.
01.08 Describe the construction of printed circuit boards (PCB's).
01.09 Explain the theoretical concepts of soldering.
01.10 Demonstrate rework and repair techniques.
01.11 Demonstrate the use of a micro-computer operating system.
01.12 Demonstrate the use of a high level computer language.
01.13 Demonstrate the use of micro-computer application programs (i.e., word processing, data base and spreadsheet).

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
02.09 Compute conductance and compute and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel-series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.

02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define resistor-capacitor (R-C) and resistor-inductor (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filer circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.

04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of cathode ray tubes.
05.24 Identify and define operating characteristics and applications of optoelectronic devices.
05.25 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic

operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze bus concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic-data analyzers to troubleshoot microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Write a computer program in assembly language.
07.12 Write a computer program in machine language.
07.13 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The

student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.

12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE PROFICIENCY IN ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electronics

CODE NUMBER: Secondary 8730000 Postsecondary _______

Florida CIP 0647.012500

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___7-9 x 9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30-31

CERTIFICATION COVERAGE: ELECTRONIC @ 7 G TEC ELEC @ 7 G RADIO TV @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electronics repairers (85717609), Electronics Testers II (726.684-026). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: direct current (DC) circuits, alternating current (AC) circuits and analog circuits; solid-state and digital devices; use of circuit diagrams and schematics; soldering and chassis assembly techniques and laboratory practices.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8730010	Electronics 1
8730020	Electronics 2
8730030	Electronics 3
8730040	Electronics 4
8730050	Electronics 5
8730060	Electronics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Algebra is recommended as a prerequisite for entry into this program.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate math skills.
09. Demonstrate appropriate understanding of basic science.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8730000

PROGRAM TITLE: Electronics
POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) meters and oscilloscopes.
02.09 Compute conductance and compute and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel- series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The

student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, and R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.

04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.

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06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuits (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents that may be required when applying for a job.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make appropriate job changes.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial		COURSE CREDIT: 1

PROGRAM TITLE: Electronics		PROGRAM NUMBER: 8730000

PROGRAM TITLE: Electronics 1		COURSE NUMBER: 8730010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in laboratory practices and in DC circuits.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and Watts' law.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) meters and oscilloscopes.
02.09 Compute and measure conductance and resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of

capacitors and inductors.

02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.

02.27 Set up and operate power supplies for DC circuits.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Electronics
PROGRAM NUMBER: 8730000

PROGRAM TITLE: Electronics 2
COURSE NUMBER: 8730020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, and R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.

03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Electronics
PROGRAM NUMBER: 8730000
PROGRAM TITLE: Electronics 3
COURSE NUMBER: 8730030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in solid-state devices.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.

04.03 Identify and define operating characteristics and application of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Setup and operate curve tracers.
04.20 Setup and operate transistor testers.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Electronics
PROGRAM NUMBER: 8730000
PROGRAM TITLE: Electronics 4
COURSE NUMBER: 8730040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in analog circuits.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Electronics	PROGRAM NUMBER: 8730000
PROGRAM TITLE: Electronics 5	COURSE NUMBER: 8730050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in digital devices.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuits (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Electronics PROGRAM NUMBER: 8730000

PROGRAM TITLE: Electronics 6 COURSE NUMBER: 8730060

COURSE DESCRIPTION:

This course is designed to provide instruction in developing technical recording and reporting skills and in demonstrating employability skills.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents that may be required when applying for a job.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make appropriate job changes.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.

11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electronics Engineering Technology

CODE NUMBER: Secondary ________ Postsecondary ________

Florida CIP 0615.030301

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as electrical and electronics technicians (22505222), electronic engineering technicians or in related occupations in electronics, or to provide supplemental training for persons previously or currently employed in these occupations. This program includes the Florida core electronics competencies as identified by the electronics industry, which is prerequisite for all specialized programs. This program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry.

Graduates of this program will be prepared to enter advanced training and education in specialized electronics related fields. They may also be employed as trainees in various electronics related positions in certain industries.

The content includes, but is not limited to, DC circuits, AC circuits, solid-state devices, analog circuits, digital circuits and microprocessor systems. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering, laboratory practices and technical recording and reporting.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials, processes and safety practices used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing electronic circuitry.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allow the student to more easily relate the technical knowledge gained to a theoretical level and to allow for a greater knowledge expansion and transference in the future.

This program requires a minimum of 15 semester hours of general education. At least two components of this core must be courses designed to develop skills in oral and written communication and in computational skills. The computational skills shall include algebra and trigonometry.

The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

Algebra is recommended as a prerequisite for entry into this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When content from the Florida common core electronics program (Electronics Technology) is included, the typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor systems.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate proficiency in direct current (DC) network analysis.
10. Demonstrate proficiency in alternating current (AC) network and coupled circuit analysis.
11. Demonstrate proficiency in design and analysis of discrete solid-state circuits.
12. Demonstrate proficiency in design and analysis of systems using linear integrated circuits.
13. Demonstrate proficiency in programming, design and analysis of microprocessor based systems.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER:

PROGRAM TITLE: Electronics Engineering Technology
POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering techniques.
01.06 Demonstrate acceptable desoldering techniques.
01.07 Demonstrate electro static discharge (ESD) safety procedures.
01.08 Describe the construction of printed circuit boards (PCB's).
01.09 Explain the theoretical concepts of soldering.
01.10 Demonstrate reqork and repair techniques.
01.11 Demonstrate the use of a micro-computer operating system.
01.12 Demonstrate the use of a high level computer language.
01.13 Demonstrate the use of micro-computer application programs (i.e., word processing, data base, spreadsheet).

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) meters and oscilloscopes.
02.09 Compute conductance and compute and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel-series and bridge circuits.
02.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.

02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define resistor-capacitor (R-C) and resistor inductor (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:
04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.

04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of cathode ray tubes.
05.24 Identify and define operating characteristics and applications of optoelectronic devices.
05.25 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:
06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.

06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:
07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze BUS concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic-data analyzers to troubleshoot microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.

08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

09.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) NETWORK ANALYSIS --The student will be able to:

09.01 Analyze multisource circuits using Millman's theorem.
09.02 Analyze multisource circuits using superposition theorem.
09.03 Analyze multisource circuits using mesh currents.
09.04 Analyze multisource circuits using branch currents.
09.05 Analyze multisource circuits using nodal analysis.
09.06 Analyze multisource circuits using Thevenin's theorem.
09.07 Analyze multisource circuits using Norton's theorem.
09.08 Analyze DC circuits using computer programs.

10.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) NETWORK AND COUPLED CIRCUIT ANALYSIS--The student will be able to:

10.01 Design and analyze magnetic circuits.
10.02 Apply Faraday's law of induced voltages.
10.03 Solve for mutual inductance in a coupled circuit.
10.04 Analyze AC circuits using network theorems.
10.05 Solve problems in transient analysis in RC and RL circuits.
10.06 Demonstrate and analyze the effects of loading on transformers.
10.07 Analyze RLC circuits using complex numbers.
10.08 Design, construct and analyze RC filters.
10.09 Analyze AC circuits using computer programs.

11.0 DEMONSTRATE PROFICIENCY IN DESIGN AND ANALYSIS OF DISCRETE SOLID-STATE CIRCUITS--The student will be able to:

11.01 Design, construct and analyze full-wave rectifier power supplies with capacitor input filters.
11.02 Design, construct and analyze zener diode regulator circuits for given load currents.
11.03 Design, construct and analyze switching power supply circuits.
11.04 Design, construct and analyze bipolar transistor amplifier Q point stability using several methods of bias.
11.05 Analyze bipolar junction transistor amplifiers using the small signal equivalent circuit.
11.06 Design and analyze bipolar junction transistor amplifiers using hybrid parameters.
11.07 Design, construct and analyze junction field.
11.08 Design, construct and analyze multistage loaded amplifiers using RC, direct and transformer coupling.
11.09 Design, construct and analyze power amplifiers using single-ended, push-pull and complementary symmetry methods.
11.10 Design, construct and analyze photoisolator, coupling and switching circuits.
11.11 Analyze discrete solid-state circuits using computer programs.

12.0 DEMONSTRATE PROFICIENCY IN DESIGN AND ANALYSIS OF SYSTEMS USING LINEAR INTEGRATED CIRCUITS--The student will be able to:

12.01 Design, construct and analyze an integrated circuit power amplifier.
12.02 Solve problems in heat sinking and power limitations for AF power amplifiers.

12.03 Select the IC's appropriate to the defined parameters of a circuit.
12.04 Measure and analyze common mode rejection ratio and DC offset for operational amplifiers.
12.05 Design and test a lag network to increase the stability of an operational amplifier.
12.06 Construct and analyze operational amplifier circuits used in limiters, zero crossing detector, comparator and sample and hold circuits.
12.07 Construct and analyze operational amplifier summing, multivibrator and active filter circuits.

13.0 DEMONSTRATE PROFICIENCY IN PROGRAMMING, DESIGN AND ANALYSIS OF MICROPROCESSOR BASED SYSTEMS--The student will be able to:

13.01 Analyze the connections and programming for interrupt driven I/Q.
13.02 Write a machine-level program and verify correct operation of switches and led's in a microprocessor system.
13.03 Design and implement the addition of RAM in a microprocessor system.
13.04 Erase and program an eprom.
13.05 Write a machine-level program to initialize a peripheral interface adaptor.
13.06 Analyze and draw a timing diagram showing all pertinent bus signals in a microprocessor system.
13.07 Analyze and decode a machine-language program using a timing diagram.
13.08 Program and interface input devices.
13.09 Program and interface output devices.
13.10 Program and interface a serial data link using a microprocessor system.
13.11 Write programs using data movement, logical and shifting.
13.12 Write programs using control loops and integer arithmetic operations on arrays of numbers.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Engineering Related Technology

CODE NUMBER: Secondary _______ Postsecondary I159999

Florida CIP 0615.999900

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__ Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30,31

CERTIFICATION COVERAGE: ANY INDUSTRIAL ED G ANY TECHNICAL ED LEVEL G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare individuals for advanced training that may result in employment as mechanical engineering technicians (22511227) or mechanical equipment engineering assistants (007.161-018). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: engineering related general education skills (English, mathematics, physics); tools, machinery, drafting skills; familiarity with working drawings and blueprints; technical recording and reporting; and an assortment of miscellaneous engineering related skills to provide a broad base of knowledge which will support advanced training in specialty areas.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: recording and reporting of engineering data; the application of problem solving techniques and mathematically-derived solutions to engineering problems or projects; production of engineering drawings and working drawings; the preparation of bills of materials from engineering or shop drawings; the application of appropriate engineering codes and specifications; the preparation of data or laboratory logbooks; the application of principles of physics, and practical experience in the application of safety principles and procedures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate engineering related English skills.
02. Apply engineering related mathematical concepts and perform engineering related calculations.
03. Demonstrate engineering related applied physics skills.
04. Apply and use safety rules and standards.
05. Apply engineering related shop or laboratory skills.
06. Demonstrate knowledge and use of engineering related tools, machinery and equipment.
07. Apply engineering related basic drafting skills.
08. Demonstrate a basic knowledge of engineering related working drawings.
09. Demonstrate engineering related computer assisted drafting skills.
10. Demonstrate proficiency in engineering related technical recording and reporting.
11. Demonstrate and apply knowledge of miscellaneous engineering related skills.
12. Demonstrate employability skills.
13. Demonstrate understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER:

PROGRAM TITLE: Engineering Related Technology
POSTSECONDARY NUMBER: I159999

01.0 DEMONSTRATE ENGINEERING RELATED ENGLISH SKILLS--The student will be able to:

01.01 Identify and define frequently used engineering related terms.
01.02 Determine the main idea of engineering related memos and instructions.
01.03 Identify and list the order of events in a set of engineering specifications.
01.04 Write a statement of how to follow a given set of written instructions.
01.05 Obtain appropriate engineering related information from pictures, maps or signs.
01.06 Demonstrate basic engineering related English writing skills.
01.07 Write an engineering related request for personnel, materials or supplies, information, notation of assignment and change order.
01.08 Write a clear, concise and sequenced series of brief statements describing the steps of an engineering related process or event.
01.09 Use a proper form when writing a simple engineering related business letter and addressing an envelope for it.
01.10 Write an engineering related letter of request, adjustment, complain, application or opinion which contains necessary and accurate information.
01.11 Proofread engineering related reports for spelling.
01.12 Write an engineering related memorandum using a proper format.

02.0 APPLY ENGINEERING RELATED MATHEMATICAL CONCEPTS AND PERFORM ENGINEERING RELATED CALCULATIONS--The student will be able to:

02.01 Solve basic mathematic problems.
02.02 Solve basic algebraic problems.
02.03 Solve basic geometric problems.
02.04 Solve basic trigonometric problems.
02.05 Define physical constant as used in mathematical equations.
02.06 Define mathematical constant as used in mathematical equations.
02.07 Define independent variable as used in mathematical equations.
02.08 Define dependent variable as used in mathematical equations.
02.09 Write the basic mathematical formula stating the relationship of force, pressure and area.
02.10 Write the basic mathematical formula stating the relationship of weight, mass and acceleration of gravity.
02.11 Write the basic mathematical formula stating the relationship of voltage, current and electrical resistance.
02.12 Distinguish between fundamental and derived units and give examples of each from the International System of units (SI) and English units.
02.13 Explain the terms "dimensionless quantity" and "radian".
02.14 Name the seven basic SI units and give the symbol and quantity measured for each.
02.15 Name the two supplementary SI units and give the symbol and quantity measured for each.
02.16 List the derived SI unit and its symbol for frequency.
02.17 Write, in the accepted notation, expressions indicating the products, quotients and reciprocals of given SI units.
02.18 Convert lengths in feet and inches to the equivalent length in SI units.

02.19 Calculate a weight in pounds, given a mass in kilograms.
02.20 Identify the term angle.
02.21 Apply the Pythagorean theorem to determine the third side of a triangle when given a right triangle with two known sides.
02.22 Add and subtract two or more given vector quantities graphically, with the aid of a scale and protractor.
02.23 Resolve a vector graphically, given the vector quantity with magnitude and direction specified and with the aid of a scale and protractor.
02.24 Draw a technically acceptable graph from a table of experimental data suitable for plotting on rectangular-coordinate graph paper.
02.25 Write a given decimal number in scientific notation.
02.26 Write a number given in scientific notation in decimal form.
02.27 Multiply and divide numbers and solve equations using the three theorems of logarithms for products and quotients.
02.28 Measure linear dimensions with a vernier caliper to the nearest 0.1 mm and with a micrometer caliper to the nearest 0.001 mm.

03.0 DEMONSTRATE ENGINEERING RELATED APPLIED PHYSICS SKILLS--The student will be able to:

03.01 Demonstrate applied skills in mechanics.
03.02 Apply and solve vectors.
03.03 Solve force and motion problems.
03.04 Solve work, energy and power problems.
03.05 Solve friction problems.
03.06 Solve circular motion problems.
03.07 Solve rotational motion problems.
03.08 Solve problems involving the properties of solids.
03.09 Solve problems involving the properties of liquids.
03.10 Solve problems involving the properties of gases.
03.11 Demonstrate applied skills in heat, light and sound.
03.12 Solve temperature and heat problems.
03.13 Solve change-of-state problems.
03.14 Solve heat transfer problems.
03.15 Solve thermodynamic problems.
03.16 Solve refrigeration and air conditioning problems.
03.17 Solve harmonic motion problems.
03.18 Solve sound wave problems.
03.19 Solve light problems.
03.20 Solve optical problems.
03.21 Demonstrate applied skills in electricity and magnetism.
03.22 Solve electric circuit problems.
03.23 Solve electromagnetic problems.
03.24 Solve alternating current problems.
03.25 Solve generator and motor problems.
03.26 Solve electrostatic problems.
03.27 Solve magnetism problems.
03.28 Apply knowledge of strengths of materials.
03.29 Solve equilibrium problems.
03.30 Solve stress and strain problems.
03.31 Solve centroid and inertia problems.
03.32 Solve connection and joint problems.
03.33 Solve problems with beam stresses.
03.34 Solve torsion problems.
03.35 Solve compression problems.
03.36 Solve tension problems.
03.37 Solve force combination problems.

04.0 APPLY AND USE SAFETY RULES AND STANDARDS--The student will be able to:

04.01 Demonstrate knowledge and use of general safety rules.

04.02 Apply general shop or laboratory safety rules and procedures.
04.03 Demonstrate the operation of shop safety devices.
04.04 Apply fire safety rules and procedures.
04.05 Apply rules and procedures for electrical safety.
04.06 Apply safety rules and procedures for installing or using control panels or other electromechanical or electronic devices.
04.07 Apply safety rules and procedures applicable to stationary or moving machinery and the use and maintenance of machine safety guards.
04.08 Apply safety rules and procedures applicable to the use of moving transports (forklifts, conveyors, small electric trucks and flatbeds, etc.) and those to be followed where such transport is being operated.
04.09 Apply safety rules and procedures to be followed when operating or using hoists, cranes, elevators and other lifting equipment.
04.10 Apply safety rules and procedures to be followed when constructing or using scaffolding.
04.11 Demonstrate safety procedures to be followed in areas where heavy equipment (earth haulers, dump trucks, cranes, scrapers, bulldozers, various heavy trucks, etc.) is being operated.
04.12 Identify safety headgear and where, how and why it is to be used.
04.13 Identify safety straps and belts and where, how and why they are to be used.
04.14 Identify safety clothing (gloves, nets, aprons, goggles, soft-soled shoes or caulked boots, etc.) and where, how and why it is to be used.
04.15 Determine and demonstrate how to apply the Occupational Safety Health Administration (OSHA) regulations regarding manufacturing enclosures and machinery.

05.0 APPLY ENGINEERING RELATED SHOP OR LABORATORY SKILLS--The student will be able to:

05.01 Apply appropriate reading and writing skills in the writing and preparation of shop or laboratory reports or logbooks and in the technical recording and reporting of shop or laboratory data.
05.02 Apply appropriate mathematical concepts and calculations to solve given shop or laboratory projects or assignments.
05.03 Apply appropriate physics concepts and calculations in the solution of given shop or laboratory projects or assignments.
05.04 Apply appropriate safety rules, regulations and procedures in a shop or laboratory setting.
05.05 Apply basic drafting skills to the solution of engineering related problems or the accumulation and presentation of engineering data in a ship or laboratory setting.
05.06 Apply knowledge of working drawings to produce usable shop or laboratory drawings for various engineering fields and to draw off representative bills of materials from given working drawings.
05.07 Demonstrate the ability to research, locate and apply the appropriate codes to given engineering problems when presented in a shop or laboratory situation.

06.0 DEMONSTRATE KNOWLEDGE AND USE OF ENGINEERING RELATED TOOLS, MACHINERY, AND EQUIPMENT--The student will be able to:

06.01 Identify and explain the use of the hand tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.).
06.02 Identify and explain the use of the smaller power tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.).
06.03 Identify and explain the use of the larger tools and machinery

used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.).

06.04 Identify and explain the use of the heavy machinery and equipment used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.).

07.0 APPLY ENGINEERING RELATED BASIC DRAFTING SKILLS--The student will be able to:

07.01 Use basic drafting tools and equipment.
07.02 Demonstrate the proper use and care of drawing equipment.
07.03 Select proper drawing instruments to complement the drafting media (mylar, vellum, etc.).
07.04 Select correct pencils or pens to draw proper line weights.
07.05 Use reproduction techniques and materials to construct a tracing.
07.06 Produce sepia, blueline, mylar and electrostatic copies.
07.07 Make Diazo (Ozalid) copies of original drawings.
07.08 Set up a drafting machine and drafting equipment.
07.09 Construct borders, information blocks and center drawings.
07.10 Construct freehand sketches.
07.11 Read and transfer measurements.
07.12 Letter freehand (letters and numerals).
07.13 Draw intersections of lines and planes.
07.14 Letter with mechanical lettering devices and templates.
07.15 Apply established drafting standards.
07.16 Construct regular polygons and ellipses.
07.17 Draw tangents to arcs, lines and circles.
07.18 Construct involutes.
07.19 Draw intersections of solids.
07.20 Prepare a simple orthographic drawing.
07.21 Identify the use and application of orthographic drawings.
07.22 Draw simple auxiliary views or revolutions.
07.23 Draw simple sectional views or conventions.
07.24 Identify the symbols used to represent different materials.
07.25 Apply dimensioning practices and techniques to drawings.
07.26 Construct the lines used to dimension drawings.
07.27 Identify the use and application of dimensioning practices.
07.28 Apply conventional tolerances.
07.29 Read and convert measurements.
07.30 Construct simple pictorial drawings.
07.31 Construct simple isometric drawings.
07.32 Construct simple oblique drawings.
07.33 Identify the use and application of pictorial drawings.
07.34 Construct a simple perspective drawing.
07.35 Construct several types of simple graphic charts.
07.36 Identify the use and application of graphic charts.

08.0 DEMONSTRATE A BASIC KNOWLEDGE OF ENGINEERING RELATED WORKING DRAWINGS--The student will be able to:

08.01 Construct drafting symbols.
08.02 Produce simple representative engineering drawings.
08.03 Draw off and prepare bills of materials.

09.0 DEMONSTRATE ENGINEERING RELATED COMPUTER ASSISTED DRAFTING SKILLS--The student will be able to:

09.01 Operate computer assisted drafting (CAD) equipment and peripherals.
09.02 Demonstrate data base management skills.
09.03 Perform applied CAD basic drafting skills.
09.04 Generate simple isometric views.

09.05 Generate simple assemblies, details and schematics.
09.06 Apply notes and special instructions.
09.07 Manipulate views.
09.08 Apply scaling.
09.09 Apply dimensioning.
09.10 Develop simple three-dimensional drawings.
09.11 Select appropriate line weight.
09.12 Generate simple layouts.
09.13 Demonstrate data processing management skills.
09.14 Develop execute lists using command language.
09.15 Write a simple FORTRAN program.
09.16 Interpret printed output.
09.17 Demonstrate post-processing file management skills.

10.0 DEMONSTRATE PROFICIENCY IN ENGINEERING RELATED TECHNICAL RECORDING AND REPORTING--The student will be able to:

10.01 Create and interpret schematics.
10.02 Record data and design curves and graphs.
10.03 Write reports and make oral presentations.
10.04 Maintain test and engineering data logs.
10.05 Make equipment failure reports.
10.06 Specify and requisition simple parts and supplies.
10.07 Compose technical letters and memoranda.
10.08 Write formal reports of laboratory experiences.
10.09 Draft preventive maintenance and calibration procedures.

11.0 DEMONSTRATE AND APPLY KNOWLEDGE OF MISCELLANEOUS ENGINEERING RELATED SKILLS--The student will be able to:

11.01 Demonstrate knowledge and use of practical geology and soils.
11.02 Apply the ability to create engineering related program education and review technique (PERT) charts to the scheduling of a simple hypothetical engineering project.
11.03 Apply the ability to create engineering related critical path method (CPM) charts to the scheduling of a simple hypothetical engineering project.
11.04 Apply the ability to create engineering related Gantt charts or lists to the scheduling of a simple hypothetical engineering project.
11.05 Demonstrate knowledge and use of slide rules, calculators and other general engineering related tools.
11.06 Demonstrate knowledge and use of engineering related reference materials.
11.07 Demonstrate the ability to read and interpret engineering related blueprints.
11.08 Demonstrate knowledge and ability in engineering related problem-solving.
11.09 Demonstrate knowledge and use of engineering related trade terms and terminology.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.

12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-to-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Essentials of Commercial Foods
CODE NUMBER: Secondary 8763200 Postsecondary
Florida CIP 0620.041302

SECONDARY SCHOOL CREDITS 5 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 ___ Postsecondary Adult Vocational
___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMM COOK @ 7 G QUAN FOOD @ 7 G
VOC HME EC @ 4 HOME EC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cooks, restaurants (65026412) and specialty cooks (313.361-026). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: food preparation and serving; and identification, storage selection and presentation of a wide variety of foods.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8763010	Commercial Foods 1
8763020	Commercial Foods 2
8763030	Commercial Foods 3
8763040	Commercial Foods 4
8763050	Commercial Foods 5

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's Individual Education Plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate acceptable professional and personal sanitation practices.
02. Demonstrate safe working practices.
03. Demonstrate equipment operation skills.
04. Demonstrate effective cost control.
05. Prepare and manage salads.
06. Prepare and manage beverages.
07. Prepare and manage sandwiches.
08. Prepare and manage fruits and vegetables.
09. Prepare and manage meats, poultry, and seafood.
10. Prepare and manage stocks, soups, and sauces/gravies.
11. Prepare and manage foods utilizing dairy products.
12. Prepare and manage foods utilizing egg products.
13. Prepare and manage foods utilizing farinaceous (starchy) products.
14. Prepare and manage basic desserts.
15. Prepare and manage basic quick breads and yeast dough.
16. Demonstrate proficiency in dining room operations.
17. Demonstrate a proficiency in customer relations.
18. Demonstrate appropriate communication skills.
19. Demonstrate appropriate math skills.
20. Demonstrate appropriate understanding of basic science.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8763200
PROGRAM TITLE: Essentials of Commercial Foods POSTSECONDARY NUMBER: ___

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
01.01.03 Identify and practice personal handling precautions for caustics and acids.
01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

01.02.01 Identify food borne illness and possible/probable causes.
01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
01.04.02 Clean and sanitize floors and walls.
01.04.03 Recognize and report indications of food spoilage.
01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
01.05.02 Clean and sanitize floors and walls.
01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

01.06.01 Degrease and clean range hoods.
01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and

local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.
02.01.09 Recognize and correct or report fire safety hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.
03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.

03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.08.03 Operate mixers and blenders in a safe and efficient manner.

03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be used when working with slicing machines.

03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)

03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.

03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.

04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.

04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.

04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.

04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.

04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)

04.03.02 Identify and apply portion control methods.

05.0 PREPARE AND MANAGE SALADS.--The student will be able to:

05.01 Identify and select materials for salad preparation.
05.02 Prepare salads.
05.03 Hold salads for service.
05.04 Garnish and present salads.
05.05 Store reusable portions.
05.06 Prepare salad dressings, cold sauces, and derivatives.

06.0 PREPARE AND MANAGE BEVERAGES.--The student will be able to:

06.01 Identify and select materials for beverage preparation.
06.02 Prepare hot and cold beverages.
06.03 Hold beverages for serving.
06.04 Garnish and present beverages.
06.05 Store reusable portions.

07.0 PREPARE AND MANAGE SANDWICHES.--The student will be able to:

07.01 Identify and select materials for sandwich preparation.
07.02 Prepare hot and cold sandwiches.
07.03 Hold sandwiches for serving.
07.04 Garnish and present sandwiches.
07.05 Store reusable portions.

08.0 PREPARE AND MANAGE FRUITS AND VEGETABLES.--The student will be able to:

08.01 Identify and select fruits and vegetables.
08.02 Prepare fruits and vegetables.
08.03 Hold fruits and vegetables for serving.
08.04 Garnish and present fruits and vegetables.
08.05 Store reusable portions.

09.0 PREPARE AND MANAGE MEATS, POULTRY AND SEAFOOD.--The student will be able to:

09.01 Identify and select meats.

09.01.01 Identify meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.01.02 Prepare meats with given recipes.
09.01.03 Hold meats for serving.
09.01.04 Garnish and present meats.
09.01.05 Store reusable portions.

09.02 Identify and select poultry.

09.02.01 Identify poultry characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.02.02 Prepare poultry with given recipes.
09.02.03 Hold poultry for serving.
09.02.04 Garnish and present poultry.
09.02.05 Store reusable portions.

09.03 Identify and select seafood.

09.03.01 Identify seafood characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
09.03.02 Prepare seafood with given recipes.
09.03.03 Hold seafood for serving.
09.03.04 Garnish and present seafood.
09.03.05 Store reusable portions.

10.0 PREPARE AND MANAGE STOCKS, SOUPS, AND SAUCES/GRAVIES.--The student will be able to:

10.01 Stocks

10.01.01 Identify and select ingredients.
10.01.02 Prepare basic stocks.
10.01.03 Store stock for future use.

10.02 Soups

10.02.01 Identify and select ingredients.
10.02.02 Prepare soups.
10.02.03 Hold soups for service.
10.02.04 Garnish and present soups
10.02.05 Store leftover portions for future use.

10.03 Sauces and Gravies

10.03.01 Identify and select ingredients.
10.03.02 Prepare sauces and gravies.
10.03.03 Hold sauces and gravies for service.
10.03.04 Store left over sauces and gravies for future use.

10.04 Specialty Soups

10.04.01 Identify and select ingredients.
10.04.02 Prepare specialty soups.
10.04.03 Hold specialty soups for service.
10.04.04 Garnish and present specialty soups.
10.04.05 Store left over portions for future use.

11.0 PREPARE AND MANAGE FOODS UTILIZING DAIRY PRODUCTS.--The student will be able to:

11.01 Identify and select dairy products.
11.02 Prepare foods utilizing dairy products using given recipes.
11.03 Hold food containing dairy products for service.
11.04 Garnish and present foods containing dairy products.
11.05 Store reusable portions.

12.0 PREPARE AND MANAGE FOODS UTILIZING EGG PRODUCTS.--The student will be able to:

12.01 Identify and select egg products.
12.02 Prepare foods utilizing egg products using given recipes.
12.03 Hold food containing egg products for service.
12.04 Garnish and present foods containing egg products.
12.05 Store reusable portions.

13.0 PREPARE AND MANAGE FOODS UTILIZING FARINACEOUS (STARCHY) PRODUCTS.--The student will be able to:

13.01 Identify and select farinaceous products.
13.02 Prepare foods utilizing farinaceous products using given recipes.
13.03 Hold food containing farinaceous products for service.
13.04 Garnish and present foods containing farinaceous products.
13.05 Store reusable portions.

14.0 PREPARE AND MANAGE BASIC DESSERTS.--The student will be able to:

14.01 Identify and select dessert ingredients.
14.02 Prepare basic dessert products.
14.03 Hold dessert products for service.
14.04 Garnish and present dessert products.
14.05 Store reusable portions.

15.0 PREPARE AND MANAGE BASIC QUICK BREADS AND YEAST DOUGH.--The student will be able to:

15.01 Quick Breads

15.01.01 Identify and select quick bread ingredients.
15.01.02 Prepare quick breads using given recipes.
15.01.03 Hold quick breads for service.
15.01.04 Present quick breads.
15.01.05 Store reusable portions.

15.02 Yeast Doughs

15.02.01 Identify and select yeast dough ingredients.
15.02.02 Prepare yeast dough products using given recipes.
15.02.03 Hold yeast dough products for service.
15.02.04 Present yeast dough products.
15.02.05 Store reusable portions.

16.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

16.01 Prepare and maintain dining room for service.
16.02 Greet and escort customers.
16.03 Customer Service.

16.03.01 Present menu/menus
16.03.02 Sell and merchandise menu items.
16.03.03 Take orders.
16.03.04 Serve food.
16.03.05 Calculate and present guest check.

16.04 Handling money.

16.04.01 Demonstrate responsible cash handling.
16.04.02 Demonstrate ability to calculate and count customers change.

17.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS.--The student will be able to:

17.01 Resolve customer complaints in a positive professional manner.
17.02 Cope with stressful situations.
17.03 Accommodate the needs of customers (handicapped, infants, elderly.)
17.04 Maintain a positive friendly dining room attitude.
17.05 Display team work.
17.06 Present a neat and clean appearance that will promote a positive

image of the establishment.

18.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

18.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
18.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
18.03 Read and follow written and oral instructions.
18.04 Answer and ask questions coherently and concisely.
18.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
18.06 Demonstrate appropriate telephone/communication skills.

19.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

19.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
19.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
19.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
19.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
19.05 Demonstrate an understanding of federal, state and local taxes and their computation.

20.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

20.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
20.02 Draw conclusions or make inferences from data.
20.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
20.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make appropriate job changes.
21.09 Demonstrate acceptable employee health habits.
21.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American

economy.

22.03 List the advantages and disadvantages of business ownership.

22.04 Identify the risks involved in ownership of a business.

22.05 Identify the necessary personal characteristics of a successful entrepreneur.

22.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Essentials of Commercial Foods
PROGRAM NUMBER: 8763200
COURSE TITLE: Commercial Foods 1
COURSE NUMBER: 8763010

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
01.01.03 Identify and practice personal handling precautions for caustics and acids.
01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

01.02.01 Identify food borne illness and possible/probable causes.
01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
01.04.02 Clean and sanitize floors and walls.
01.04.03 Recognize and report indications of food spoilage.
01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
01.05.02 Clean and sanitize floors and walls.
01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

01.06.01 Degrease and clean range hoods.
01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.
02.01.09 Recognize and correct or report fire safety hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.
03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.

03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.
03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.08.03 Operate mixers and blenders in a safe and efficient manner.
03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be used when working with slicing machines.
03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)
03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.
03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.
04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.
04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.
04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Essentials of Commercial Foods
PROGRAM NUMBER: 8763200
COURSE TITLE: Commercial Foods 3
COURSE NUMBER: 8763030

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

09.0 PREPARE AND MANAGE MEATS, POULTRY AND SEAFOOD.--The student will be able to:

- 09.01 Identify and select meats.
  - 09.01.01 Identify meat characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
  - 09.01.02 Prepare meats with given recipes.
  - 09.01.03 Hold meats for serving.
  - 09.01.04 Garnish and present meats.
  - 09.01.05 Store reusable portions.
- 09.02 Identify and select poultry.
  - 09.02.01 Identify poultry characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
  - 09.02.02 Prepare poultry with given recipes.
  - 09.02.03 Hold poultry for serving.
  - 09.02.04 Garnish and present poultry.
  - 09.02.05 Store reusable portions.
- 09.03 Identify and select seafood.
  - 09.03.01 Identify seafood characteristics, proper cooking and done temperatures, traditional side dishes and condiments, possible parasites, and potential micro-organism growth.
  - 09.03.02 Prepare seafood with given recipes.
  - 09.03.03 Hold seafood for serving.
  - 09.03.04 Garnish and present seafood.
  - 09.03.05 Store reusable portions.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Essentials of Commercial Foods
PROGRAM NUMBER: 8763200
COURSE TITLE: Commercial Foods 4
COURSE NUMBER: 8763040

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

10.0 PREPARE AND MANAGE STOCKS, SOUPS, AND SAUCES/GRAVIES.--The student will be able to:

10.01 Stocks

10.01.01 Identify and select ingredients.
10.01.02 Prepare basic stocks.
10.01.03 Store stock for future use.

10.02 Soups

10.02.01 Identify and select ingredients.
10.02.02 Prepare soups.
10.02.03 Hold soups for service.
10.02.04 Garnish and present soups
10.02.05 Store leftover portions for future use.

10.03 Sauces and Gravies

10.03.01 Identify and select ingredients.
10.03.02 Prepare sauces and gravies.
10.03.03 Hold sauces and gravies for service.
10.03.04 Store left over sauces and gravies for future use.

10.04 Specialty Soups

10.04.01 Identify and select ingredients.
10.04.02 Prepare specialty soups.
10.04.03 Hold specialty soups for service.
10.04.04 Garnish and present specialty soups.
10.04.05 Store left over portions for future use.

11.0 PREPARE AND MANAGE FOODS UTILIZING DAIRY PRODUCTS.--The student will be able to:

11.01 Identify and select dairy products.
11.02 Prepare foods utilizing dairy products using given recipes.
11.03 Hold food containing dairy products for service.
11.04 Garnish and present foods containing dairy products.
11.05 Store reusable portions.

12.0 PREPARE AND MANAGE FOODS UTILIZING EGG PRODUCTS.--The student will be able to:

12.01 Identify and select egg products.
12.02 Prepare foods utilizing egg products using given recipes.
12.03 Hold food containing egg products for service.
12.04 Garnish and present foods containing egg products.
12.05 Store reusable portions.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education — COURSE CREDIT: 1
PROGRAM TITLE: Essentials of Commercial Foods — PROGRAM NUMBER: 8763200
COURSE TITLE: Commercial Foods 5 — COURSE NUMBER: 8763050

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

13.0 PREPARE AND MANAGE FOODS UTILIZING FARINACEOUS (STARCHY) PRODUCTS.--The student will be able to:

13.01 Identify and select farinaceous products.
13.02 Prepare foods utilizing farinaceous products using given recipes.
13.03 Hold food containing farinaceous products for service.
13.04 Garnish and present foods containing farinaceous products.
13.05 Store reusable portions.

14.0 PREPARE AND MANAGE BASIC DESSERTS.--The student will be able to:

14.01 Identify and select dessert ingredients.
14.02 Prepare basic dessert products.
14.03 Hold dessert products for service.
14.04 Garnish and present dessert products.
14.05 Store reusable portions.

15.0 PREPARE AND MANAGE BASIC QUICK BREADS AND YEAST DOUGH.--The student will be able to:

15.01 Quick Breads

15.01.01 Identify and select quick bread ingredients.
15.01.02 Prepare quick breads using given recipes.
15.01.03 Hold quick breads for service.
15.01.04 Present quick breads.
15.01.05 Store reusable portions.

15.02 Yeast Doughs

15.02.01 Identify and select yeast dough ingredients.
15.02.02 Prepare yeast dough products using given recipes.
15.02.03 Hold yeast dough products for service.
15.02.04 Present yeast dough products.
15.02.05 Store reusable portions.

16.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

16.01 Prepare and maintain dining room for service.
16.02 Greet and escort customers.

16.03 Customer Service.

- 16.03.01 Present menu/menus
- 16.03.02 Sell and merchandise menu items.
- 16.03.03 Take orders.
- 16.03.04 Serve food.
- 16.03.05 Calculate and present guest check.

16.04 Handling money.

- 16.04.01 Demonstrate responsible cash handling.
- 16.04.02 Demonstrate ability to calculate and count customers change.

17.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS.--The student will be able to:

- 17.01 Resolve customer complaints in a positive professional manner.
- 17.02 Cope with stressful situations.
- 17.03 Accommodate the needs of customers (handicapped, infants, elderly.)
- 17.04 Maintain a positive friendly dining room attitude.
- 17.05 Display team work.
- 17.06 Present a neat and clean appearance that will promote a positive image of the establishment.

18.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 18.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 18.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 18.03 Read and follow written and oral instructions.
- 18.04 Answer and ask questions coherently and concisely.
- 18.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 18.06 Demonstrate appropriate telephone/communication skills.

19.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

- 19.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
- 19.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
- 19.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
- 19.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 19.05 Demonstrate an understanding of federal, state and local taxes and their computation.

20.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

- 20.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
- 20.02 Draw conclusions or make inferences from data.
- 20.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

20.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make appropriate job changes.
21.09 Demonstrate acceptable employee health habits.
21.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Essentials of Food Production

CODE NUMBER: Secondary 8763100 Postsecondary ______

Florida CIP 0620.041301

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: COMM COOK @ 7 G QUAN FOOD @ 7 G
VOC HME EC @ 4 HOME EC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cooks, restaurants (65026412) and cook helpers (317.687-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: food preparation and serving; and identification, storage selection and presentation of a wide variety of foods.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8763010	Commercial Foods 1
8763020	Commercial Foods 2
8763030	Commercial Foods 3

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's Individual Education Plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate acceptable professional and personal sanitation practices.
02. Demonstrate safe working practices.
03. Demonstrate equipment operation skills.
04. Demonstrate effective cost control.
05. Prepare and manage salads.
06. Prepare and manage beverages.
07. Prepare and manage sandwiches.
08. Prepare and manage fruits and vegetables.
09. Demonstrate proficiency in dining room operations.
10. Demonstrate a proficiency in customer relations.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8763100

PROGRAM TITLE: Essentials of Food Production POSTSECONDARY NUMBER: ___

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
01.01.03 Identify and practice personnel handling precautions for caustics and acids.
01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

01.02.01 Identify food borne illness and possible/probable causes.
01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
01.04.02 Clean and sanitize floors and walls.
01.04.03 Recognize and report indications of food spoilage.
01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
01.05.02 Clean and sanitize floors and walls.
01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

01.06.01 Degrease and clean range hoods.
01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.
02.01.09 Recognize and correct or report fire safety hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient

manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.
03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.
03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.08.03 Operate mixers and blenders in a safe and efficient manner.
03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be used when working with slicing machines.
03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)
03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.
03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.
04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.
04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.
04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)
04.03.02 Identify and apply portion control methods.

05.0 PREPARE AND MANAGE SALADS.--The student will be able to:

05.01 Identify and select materials for salad preparation.
05.02 Prepare salads.
05.03 Hold salads for service.
05.04 Garnish and present salads.
05.05 Store reusable portions.
05.06 Prepare salad dressings, cold sauces, and derivatives.

06.0 PREPARE AND MANAGE BEVERAGES.--The student will be able to:

06.01 Identify and select materials for beverage preparation.
06.02 Prepare hot and cold beverages.
06.03 Hold beverages for serving.
06.04 Garnish and present beverages.
06.05 Store reusable portions.

07.0 PREPARE AND MANAGE SANDWICHES.--The student will be able to:

07.01 Identify and select materials for sandwich preparation.
07.02 Prepare hot and cold sandwiches.
07.03 Hold sandwiches for serving.
07.04 Garnish and present sandwiches.
07.05 Store reusable portions.

08.0 PREPARE AND MANAGE FRUITS AND VEGETABLES.--The student will be able to:

08.01 Identify and select fruits and vegetables.
08.02 Prepare fruits and vegetables.
08.03 Hold fruits and vegetables for serving.
08.04 Garnish and present fruits and vegetables.
08.05 Store reusable portions.

09.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

09.01 Prepare and maintain dining room for service.
09.02 Greet and escort customers.
09.03 Customer Service.

09.03.01 Present menu/menus
09.03.02 Sell and merchandise menu items.
09.03.03 Take orders.
09.03.04 Serve food.
09.03.05 Calculate and present guest check.

09.04 Handling money.

09.04.01 Demonstrate responsible cash handling.
09.04.02 Demonstrate ability to calculate and county customers change.

10.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS.--The student will be able to:

10.01 Resolve customer complaints in a positive professional manner.
10.02 Cope with stressful situations.
10.03 Accommodate the needs of customers (handicapped, infants, elderly.)
10.04 Maintain a positive friendly dining room attitude.
10.05 Display team work.
10.06 Present a neat and clean appearance that will promote a positive image of the establishment.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job

interview.

14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes..
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statues Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Essentials of Food Production

PROGRAM NUMBER: 8763100

COURSE TITLE: Commercial Foods 1

COURSE NUMBER: 8763010

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

01.01 Chemical/Cleaning Agents

01.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
01.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
01.01.03 Identify and practice personnel handling precautions for caustics and acids.
01.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

01.02 Food Borne Illness

01.02.01 Identify food borne illness and possible/probable causes.
01.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

01.03 Personal Sanitation

01.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

01.04 Receiving/Dry Stores Area

01.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
01.04.02 Clean and sanitize floors and walls.
01.04.03 Recognize and report indications of food spoilage.
01.04.04 Recognize and report indications of insect or rodent infestation.

01.05 Food Preparation Areas

01.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
01.05.02 Clean and sanitize floors and walls.
01.05.03 Recognize and report indications of insect or rodent infestation.

01.06 Range Hoods

01.06.01 Degrease and clean range hoods.
01.06.02 Remove, clean, and replace filters.

01.07 Reefers, Chill Boxes, and Freezers (Refrigerated Spaces)

01.07.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.07.02 Recognize and practice sanitary/safe food handling practices in refrigerated spaces.
01.07.03 Recognize and maintain clean and sanitary refrigerated spaces.
01.07.04 Recognize and report indications of food spoilage.

01.08 Food holding/Serving lines

01.08.01 Identify safe/correct operating temperatures and limits in accordance with state and county codes and local practices.
01.08.02 Recognize and practice sanitary/safe food handling practices in food holding areas and serving lines.
01.08.03 Recognize and maintain clean and sanitary food holding areas and serving lines.
01.08.04 Recognize and report indications of food spoilage.

01.09 Dishware/Tableware

01.09.01 Properly prepare dish washing area for use.
01.09.02 Properly prepare, clean, rinse, sanitize, and dry dishware and tableware items.
01.09.03 Properly clean, sanitize, and secure dish washing area.

01.10 Pots, Pans, and Cook Utensils

01.10.01 Properly prepare deep-sink area for use.
01.10.02 Properly prepare, clean, rinse, sanitize and dry pots, pans and cooking utensils.
01.10.03 Properly clean, sanitize, and secure deep-sink area.

01.11 Guest/Customer Areas

01.11.01 Properly clean and sanitize counter areas.
01.11.02 Properly clean and sanitize dining areas.
01.11.03 Properly clean and sanitize restrooms.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

02.01 Safety Hazards

02.01.01 Identify physical safety rules.
02.01.02 Identify physical safety hazards.
02.01.03 Recognize and correct or report physical safety hazards.
02.01.04 Identify electrical safety rules.
02.01.05 Identify electrical safety hazards.
02.01.06 Recognize and correct or report electrical safety hazards.
02.01.07 Identify fire safety rules.
02.01.08 Identify fire safety hazards.

02.01.09 Recognize and correct or report fire safety hazards.

02.02 First Aid

02.02.01 Identify First Aid requirements for a commercial food service operation.
02.02.02 Prepare subject and perform Heimlich maneuver.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

03.01 Hand Tools

03.01.01 Identify special precautions to be used when working with hand tools.
03.01.02 Select and use hand tools in a safe and efficient manner.

03.02 Beverage Equipment

03.02.01 Identify special precautions to be used when working with beverage equipment.
03.02.02 Correctly assemble and disassemble beverage equipment.
03.02.03 Operate beverage equipment in a safe and efficient manner.

03.03 Pressure Cookers and Steam Equipment

03.03.01 Identify special precautions to be used when working with steam under pressure.
03.03.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.
03.03.03 Operate pressure cookers and steam equipment in a safe and efficient manner.

03.04 Grinders and Tenderizers

03.04.01 Identify special precautions to be used when working with grinders and tenderizers.
03.04.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
03.04.03 Operate grinders and tenderizers in a safe and efficient manner.

03.05 Knives and Cutting Tools

03.05.01 Identify special precautions to be used when working with knives and cutting tools.
03.05.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
03.05.03 Use knives and cutting tools in a safe and efficient manner.

03.06 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

03.06.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
03.06.02 Correctly assemble and disassemble equipment.

Inspect all parts and report any discrepancy.

03.06.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

03.07 Proofers

03.07.01 Identify special precautions to be used when working with proofers.

03.07.02 Correctly assemble and disassemble equipment. Inspect all parts, gaskets and seals and report any discrepancy.

03.07.03 Operate proofers in a safe and efficient manner.

03.08 Mixers and Blenders

03.08.01 Identify special precautions to be used when working with mixers and blenders.

03.08.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.08.03 Operate mixers and blenders in a safe and efficient manner.

03.08.04 Perform the above competencies for all accessories or attachments used with the equipment.

03.09 Slicing Machines

03.09.01 Identify special precautions to be used when working with slicing machines.

03.09.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy. (Note: Special attention should be given to the guards on this machine.)

03.09.03 Operate slicing machines in a safe and efficient manner.

03.10 Food Warmers

03.10.01 Identify special precautions to be used when working with food warmers.

03.10.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.

03.10.03 Operate food warmers in a safe and efficient manner.

04.0 DEMONSTRATE EFFECTIVE COST CONTROL.--The student will be able to:

04.01 Inventory Control

04.01.01 Receive stores/supplies, count accurately and compare quantity received against invoice. Record received amount and process invoice in accordance with local procedures.

04.01.02 Store received stores/supplies in proper location. Rotate stores/materials in accordance with local procedures.

04.01.03 Conduct and accurately record an inventory of stores/supplies. Process inventory in accordance with local procedures.

04.01.04 Make break-outs and distribute stores/supplies. Utilize local procedures to maintain perpetual inventory.

04.02 Weights and Measures

04.02.01 Identify standard volume, liquid and weight as they apply to commercial food operations.
04.02.02 Convert accurately between standard units of measure as applicable to commercial food operations.
04.02.03 Convert recipes for both a greater and lesser number of portions.

04.03 Portion Control

04.03.01 Identify principles of portion control and calculate cost per serving (Note: Cost of incorrect portion size, waste, and spoilage may be addressed here.)
04.03.02 Identify and apply portion control methods.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Essentials of Food Production

PROGRAM NUMBER: 8763100

COURSE TITLE: Commercial Foods 2

COURSE NUMBER: 8763020

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

05.0 PREPARE AND MANAGE SALADS.--The student will be able to:

05.01 Identify and select materials for salad preparation.
05.02 Prepare salads.
05.03 Hold salads for service.
05.04 Garnish and present salads.
05.05 Store reusable portions.
05.06 Prepare salad dressings, cold sauces, and derivatives.

06.0 PREPARE AND MANAGE BEVERAGES.--The student will be able to:

06.01 Identify and select materials for beverage preparation.
06.02 Prepare hot and cold beverages.
06.03 Hold beverages for serving.
06.04 Garnish and present beverages.
06.05 Store reusable portions.

07.0 PREPARE AND MANAGE SANDWICHES.--The student will be able to:

07.01 Identify and select materials for sandwich preparation.
07.02 Prepare hot and cold sandwiches.

07.03 Hold sandwiches for serving.
07.04 Garnish and present sandwiches.
07.05 Store reusable portions.

08.0 PREPARE AND MANAGE FRUITS AND VEGETABLES.--The student will be able to:

08.01 Identify and select fruits and vegetables.
08.02 Prepare fruits and vegetables.
08.03 Hold fruits and vegetables for serving.
08.04 Garnish and present fruits and vegetables.
08.05 Store reusable portions.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Essentials of Food Production — PROGRAM NUMBER: 8763100

COURSE TITLE: Commercial Foods 3 — COURSE NUMBER: 8763030

COURSE DESCRIPTION:

01.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.

02.0 DEMONSTRATE SAFE WORKING PRACTICES.

03.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.

NOTE: The above outcomes contain student performance standards which shall be repeated throughout the duration of this program.

09.0 DEMONSTRATE PROFICIENCY IN DINING ROOM OPERATIONS.--The student will be able to:

09.01 Prepare and maintain dining room for service.
09.02 Greet and escort customers.
09.03 Customer Service.

    09.03.01 Present menu/menus
    09.03.02 Sell and merchandise menu items.
    09.03.03 Take orders.
    09.03.04 Serve food.
    09.03.05 Calculate and present guest check.

09.04 Handling money.

    09.04.01 Demonstrate responsible cash handling.
    09.04.02 Demonstrate ability to calculate and county customers change.

10.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS.--The student will be able to:

10.01 Resolve customer complaints in a positive professional manner.
10.02 Cope with stressful situations.
10.03 Accommodate the needs of customers (handicapped, infants, elderly.)
10.04 Maintain a positive friendly dining room attitude.
10.05 Display team work.
10.06 Present a neat and clean appearance that will promote a positive

image of the establishment.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statues Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American

economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Film Production Equipment Operations

CODE NUMBER: Secondary ______ Postsecondary I100112

Florida CIP 0610.010201

SECONDARY
SCHOOL CREDITS ____ COLLEGE CREDITS ___ POSTSECONDARY ADULT
VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): __7-9 __9-12 x Postsecondary Adult Vocational

______Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: TV PRO TEC @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment in film production equipment operation occupations, as camera assistants, sound equipment operators, editing equipment operators, set builders, grips and lighting equipment operators, or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, instruction that prepares individuals to function as members of a technical team within the framework of an organized film production. Instruction includes: purchasing/renting, scheduling and the application of technical skills to solving unique shooting problems. Also included are skills relating to professionalism, employability, communication and supervision.

II. LABORATORY ACTIVITIES: Production activities are an integral part of this program and provide practical application and instruction in the operation of equipment in areas of filming, lighting, sound, set construction, gripping and editing. In addition students will be exposed to production management, special effects, script supervision, casting, make-up, wardrobe and assistant directing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Construct and install theatrical scenery to the specifications required in a scene design for a film production.
02. Operate audio equipment for film productions.
03. Function as part of a technical support team in planning, implementing and running the technical aspects of film production.
04. Be knowledgeable of the interrelationship which exists between the various creative and craft skills required for film production.
05. Execute pre-production, production and post-production tasks for the area of gripping.
06. Execute the audio requirements for film production.
07. Execute pre-production, production and post-production tasks for the area of camera assisting.
08. Execute pre-production, production and post-production tasks for the area of film editing equipment operation.
09. Execute pre-production, production and post-production tasks for the area of film lighting.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER:
PROGRAM TITLE: Film Production Equipment Operations POSTSECONDARY NUMBER: I100112

01.0 CONSTRUCT AND INSTALL THEATRICAL SCENERY TO THE SPECIFICATIONS REQUIRED IN A SCENE DESIGN FOR A FILM PRODUCTION--The student will be able to:

01.01 Purchase appropriate materials and hardware for scenic construction.
01.02 Construct common flat scenery.
01.03 Construct three-dimensional scenery.
01.04 Execute application techniques used in painting scenery.
01.05 Construct special effects scenery.
01.06 Schedule and organize transportation of scenery to remote locations.
01.07 Supervise scene shop activities.

02.0 OPERATE AUDIO EQUIPMENT FOR FILM PRODUCTIONS--The student will be able to:

02.01 Operate sound reinforcement systems to meet performance needs.
02.02 Operate various audio equipment to achieve proper sound mix on an audio mixer.
02.03 Perform transactions with audio suppliers.
02.04 Execute the design for proper microphone and speaker placement.

03.0 FUNCTION AS PART OF A TECHNICAL SUPPORT TEAM IN PLANNING, IMPLEMENTING AND RUNNING THE TECHNICAL ASPECTS OF FILM PRODUCTION--The student will be able to:

03.01 Perform as a member of a technical support team within the framework of an organized film production.
03.02 Execute job assignments in order to meet production deadlines.
03.03 Execute technical needs to apply accepted principles of film technology to production situation(s).

04.0 BE KNOWLEDGEABLE OF THE INTERRELATIONSHIP WHICH EXISTS BETWEEN THE VARIOUS CREATIVE AND CRAFT SKILLS REQUIRED FOR FILM PRODUCTION--The student will be able to:

04.01 Differentiate the working relationships which exist between the various participants involved in the film making process.
04.02 Demonstrate the proper use of standard film making forms.
04.03 Define the specific technical processes used by the camera, grip, lighting, sound, art, costume, special effects, make-up and editing.
04.04 Execute strategies for meeting the technical requirements of a film production crew.

05.0 EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF GRIPPING--The student will be able to:

05.01 Execute strategies to properly utilize grip equipment during film production.
05.02 Accept directions in the placement of dollies, cranes and other camera mounts as required for film production.
05.03 Execute pre and post-production routines.
05.04 Work as a member of a film production team.
05.05 Develop appropriate industry contacts.

05.06 Demonstrate safe work habits.
05.07 Assist in determining grip equipment needs.
05.08 Execute required effects for lighting set-ups.

06.0 EXECUTE THE AUDIO REQUIREMENTS FOR FILM PRODUCTION--The student will be able to:

06.01 Execute strategies for recording production film sound to acceptable industry standards.
06.02 Record production and post-production sound.
06.03 Work as a member of a film production team.
06.04 Develop appropriate industry contacts.
06.05 Assist in analyzing audio needs for film production to perform transactions with suppliers.

07.0 EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF CAMERA ASSISTING--The student will be able to:

07.01 Assist in the execution of shooting activities using standard industry camera equipment.
07.02 Assist in shooting activities required for appropriate camera department documentation.
07.03 Execute the proper care and handling of camera and camera assist equipment.
07.04 Work as a member of a film production team.
07.05 Develop appropriate industry contacts.
07.06 Assist in analyzing production requirements to determine camera equipment needs.

08.0 EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF FILM EDITING EQUIPMENT OPERATION--The student will be able to:

08.01 Operate editing equipment.
08.02 Execute standard editing room routines.
08.03 Execute required editing room documentation.
08.04 Work as a member of a film production team.
08.05 Develop appropriate industry contacts.
08.06 Work with suppliers and film laboratories.
08.07 Execute editing sequences using industry standard equipment.

09.0 EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF FILM LIGHTING--The student will be able to:

09.01 Utilize standard film lighting equipment to production specifications.
09.02 Execute power distribution system for film lighting equipment.
09.03 Execute pre and post-production routines necessary for the lighting department.
09.04 Work as a member of a film production team.
09.05 Create a safe working environment.
09.06 Develop appropriate industry contacts.
09.07 Execute production requirements to determine lighting equipment and maintenance needs.
09.08 Execute required lighting effects for film shooting.
09.09 Hang, connect and focus lights for a production.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.

10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make appropriate job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Film Production Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0610.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS _x_ POSTSECONDARY ADULT VOCATIONAL CREDITS __

APPLICABLE LEVEL(S): ___7-9 __9-12 ___Postsecondary Adult Vocational

_x_ Postsecondary Vocational ______ Other __________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as film production technicians, initial employment as camera operators, sound mixers, editors, editing assistants, set designers, key grips, gaffers, and best boys or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, instruction that prepares individuals to function as members of a technical team within the framework of an organized film/video production. Instruction includes: production analysis, interpretation, purchasing/renting, scheduling and the application of production skills to solving unique shooting problems. Also included are skills relating to professionalism, employability, communication and management.

II. LABORATORY ACTIVITIES: Production activities are an integral part of this program and provide practical application and instruction in the areas of camera, lighting, sound, set construction, gripping and editing. In addition students will be exposed to other related skill areas such as, but not limited to, production management, special effects, script supervision, casting, make up, wardrobe and assistant directing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Design and supervise the construction and installation of theatrical scenery to the specifications required in a scene for a film or video production.
02. Formulate strategies for audio reinforcement for film/video productions.
03. Create a "sound track" for theatrical/film productions.
04. Supervise the hanging, focusing and circuiting of stage lights to the specifications required in lighting designs.
05. Function as part of a technical team in planning, implementing and running the technical aspects of theatrical/film productions.
06. Interpret the interrelationship which exists between the various creative and craft skills required for film/video production.
07. Analyze and implement pre-production, production and post-production tasks for the area of gripping.
08. Interpret and implement the audio requirements for film production.
09. Analyze and execute pre-production, production and post-production tasks for the area of camera.
10. Analyze and execute pre-production, production and post-production tasks for the area of film/video editing.
11. Analyze and execute pre-production, production and post-production tasks for the area of film lighting.
12. Organize and implement, as part of a technical team, a motion picture production.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Film Production Technology POSTSECONDARY NUMBER:

01.0 DESIGN AND SUPERVISE THE CONSTRUCTION AND INSTALLATION OF THEATRICAL SCENERY TO THE SPECIFICATIONS REQUIRED IN A SCENE FOR A FILM OF VIDEO PRODUCTION. The student will be able to:

01.01 Design and draft scenic plans to scale.
01.02 Interpret scenic plans for the appropriate use of materials and hardware for scenic construction.
01.03 Formulate design strategies for the construction of common flat scenery.
01.04 Formulate design strategies for the construction of three-dimensional scenery.
01.05 Translate scene design needs into application techniques used in painting scenery.
01.06 Create special effects scenery.
01.07 Schedule and organize transportation of scenery to remote locations.
01.08 Supervise scene shop activities.

02.0 FORMULATE STRATEGIES FOR AUDIO REINFORCEMENT OF FILM/VIDEO PRODUCTIONS. The student will be able to:

02.01 Evaluate performance needs.
02.02 Evaluate technical resources as appropriate to given spaces.
02.03 Configure and operate sound reinforcement systems to meet performance needs.
02.04 Analyze various audio qualities to achieve proper sound mix on an audio mixer.
02.05 Perform transactions with audio suppliers.
02.06 Design a plot for proper microphone and speaker placement.

03.0 CREATE A "SOUND TRACK" FOR THEATRICAL/FILM PRODUCTIONS. The student will be able to:

03.0 Select sound material.
03.02 Compose, by recording and editing, a sound tape for theatrical/ broadcast productions.
03.03 Supervise the operation of sound system components as required for both reinforcement and effects applications.
03.04 Design mechanical and electrical sound effects for productions.
03.05 Evaluate the quality of sound cue execution in recorded and live performance.

04.0 SUPERVISE THE HANGING, FOCUSING AND CIRCUITING OF STAGE LIGHTS TO THE SPECIFICATIONS REQUIRED IN LIGHTING DESIGNS. The student will be able to:

04.01 Design a standard lighting plot.
04.02 Analyze and document lighting requirements for production.
04.03 Supervise hanging, circuiting and focusing lights for a production.
04.04 Manage lighting area operations.
04.05 Schedule lighting area.
04.06 Distinguish various applications of stage lighting equipment.
04.07 Appraise maintenance needs for lighting equipment.
04.08 Design special-effects lighting.

05.0 FUNCTION AS PART OF A TECHNICAL TEAM IN PLANNING, IMPLEMENTING, AND RUNNING THE TECHNICAL ASPECTS OF THEATRICAL/FILM PRODUCTIONS. The student will be able to:

05.01 Perform as a member of a technical team within the framework of an organized theater/film production.
05.02 Supervise job assignments in order to meet production deadlines.
05.03 Interpret technical needs to apply accepted principles of theater/film technology to production situation(s).
05.04 Adapt learned skills and generate new approaches in order to solve unique production problems.

06.0 INTERPRET THE INTERRELATIONSHIP WHICH EXISTS BETWEEN THE VARIOUS CREATIVE AND CRAFT SKILLS REQUIRED FOR FILM/VIDEO PRODUCTION. The student will be able to:

06.01 Differentiate the working relationships which exist between the various participants involved in the film making process.
06.02 Demonstrate the proper use of standard film making forms.
06.03 Analyze a film script for its technical requirements.
06.04 Define the specific technical processes used by the camera, grip, lighting, sound, art, costume, special effects, make up and editing departments.
06.05 Propose strategies for meeting the technical requirements of a film production crew.
06.06 Compare the techniques used in film and video production.

07.0 ANALYZE AND IMPLEMENT PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF GRIPPING. The student will be able to:

07.01 Formulate strategies to properly utilize grip equipment during film/video production.
07.02 Translate script needs into creative uses of dollies, cranes and other camera mounts as required for film and video production.
07.03 Originate solutions to unique shooting problems.
07.04 Organize pre and post-production routines.
07.05 Analyze a script for its technical requirements.
07.06 Work as a member of a film production team.
07.07 Develop appropriate industry contacts.
07.08 Demonstrate safe work habits.
07.09 Analyze production requirements to determine grip equipment needs.
07.10 Create required effects for lighting set-ups.

08.0 INTERPRET AND IMPLEMENT THE AUDIO REQUIREMENTS FOR FILM PRODUCTION.--The student will be able to:

08.01 Formulate strategies for recording production film sound to acceptable industry standards.
08.02 Record production and post-production sound.
08.03 Design sound score appropriate to production and post-production needs.
08.04 Organize pre and post-production routines necessary for the sound department.
08.05 Correctly interpret script information relative to film sound.
08.06 Work as a member of a film production team.
08.07 Develop appropriate industry contacts.
08.08 Analyze audio needs for film production to perform transactions with suppliers.

09.0 ANALYZE AND EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF CAMERA. The student will be able to:

09.01 Analyze the aesthetic needs of a shot and accomplish them by using standard industry camera equipment.
09.02 Interpret shooting activities required for appropriate camera department documentation.
09.03 Organize the proper care and handling of camera and camera assist equipment.
09.04 Analyze the script for camera lens and shot requirements.
09.05 Organize pre and post-production routines for film camera operation.
09.06 Work as a member of a film production team.
09.07 Develop appropriate industry contacts.
09.08 Analyze production requirements to determine camera equipment needs.

10.0 ANALYZE AND EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF FILM/VIDEO EDITING. The student will be able to:

10.01 Interpret script materials for the best editing choices.
10.02 Organize standard editing room routines.
10.03 Execute required editing room documentation.
10.04 Work as a member of a film production team.
10.05 Develop appropriate industry contacts.
10.06 Analyze editing needs to perform transactions with suppliers and film laboratories.
10.07 Compose editing sequences using industry standard equipment.

11.0 ANALYZE AND EXECUTE PRE-PRODUCTION, PRODUCTION AND POST-PRODUCTION TASKS FOR THE AREA OF FILM LIGHTING. The student will be able to:

11.01 Formulate strategies to utilize standard film lighting equipment to production specifications.
11.02 Design and implement a power distribution system for film lighting equipment.
11.03 Organize pre and post-production routines necessary for the lighting department.
11.04 Work as a member of a film production team.
11.05 Create a safe working environment.
11.06 Develop appropriate industry contacts.
11.07 Analyze production requirements to determine lighting equipment needs.
11.08 Create required lighting effects for film shooting.

12.0 ORGANIZE AND IMPLEMENT, AS PART OF A TECHNICAL TEAM, A MOTION PICTURE PRODUCTION. The student will be able to:

12.01 Function as a member of a technical team within the framework of an organized film production.
12.02 Manage resources in order to meet production deadlines.
12.03 Analyze job needs and perform transactions with rental houses and suppliers.
12.04 Apply accepted principles of film technology to production situation(s).
12.05 Interpret a film script and storyboard for their production requirements.
12.06 Evaluate learned skills in order to generate new approaches for solving unique production problems.
12.07 Manage production crews.
12.08 Develop appropriate industry contacts.
12.09 Formulate and implement a production plan in the areas of syncsound, camera, grip, electrical, sound, art direction, post-production, special effects, wardrobe, makeup, assistant direction, casting, script supervision and production management.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Fire Sprinkler System Installation

CODE NUMBER: Secondary ______ Postsecondary I460502

Florida CIP 0646.050200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: PLUMBIN @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plumbers, pipefitters (87502560), fire sprinkler system installers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, the assembly, installation, and repair of pipes, fittings, and fixtures for fire protection systems according to specifications and National Fire Protection Association (NFPA) codes.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of fire sprinkler tools to lay out, build, test, and maintain fire sprinkler systems in both residential and commercial applications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this vocational program: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic piping skills.
02. Perform pipe joining.
03. Read and interpret blueprints and specifications.
04. Lay out a job.
05. Install first floor and above.
06. Trim out fire protection system.
07. Repair, service and maintain fire protection system.
08. Demonstrate general knowledge of fire protection.
09. Apply water supply requirements for sprinkler system.
10. Demonstrate installation of wet system.
11. Demonstrate installation of a dry system.
12. Demonstrate installation of a preaction and deluge system.
13. Demonstrate installation of a combined dry pipe and preaction system.
14. Demonstrate installation of an anti-freeze system.
15. Demonstrate installation of a stand-pipe system.
16. Demonstrate appropriate communication skills.
17. Demonstrate appropriate math skills.
18. Demonstrate an understanding of basic science.
19. Demonstrate employability skills.
20. Demonstrate entrepreneurship skills.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER:

PROGRAM TITLE: Fire Sprinkler System Installation

POSTSECONDARY NUMBER: 1460502

01.0 PERFORM BASIC PIPING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of fire protection.
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify fire sprinkler components.
01.09 Read, interpret and comply with manufacturer's schematics and specifications.
01.10 Find information in technical literature.
01.11 Give field reports orally and in writing.
01.12 Comply with oral and written instructions.

02.0 PERFORM PIPE JOINING--The student will be able to:

02.01 Join approved plastic pipe using the adaptor-solvent cement method.
02.02 Cut plastic pipe.
02.03 Bend steel pipe with a heavy-duty bending tool.
02.04 Bend steel pipe with a chain vise and torch.
02.05 Cut steel pipe with a one-wheel steel pipe cutter.
02.06 Cut steel pipe with a four-wheel steel pipe cutter.
02.07 Join plastic pipe to steel pipe.
02.08 Thread steel pipe with an adjustable diestock.
02.09 Thread steel pipe with a non-adjustable diestock.
02.10 Thread steel pipe with a power-driven vise stand.
02.11 Cut copper tubing or pipe with a hacksaw.
02.12 Cut copper tubing or pipe with a tubing cutter.
02.13 Bend copper tubing or pipe with a bender.
02.14 Join copper tubing to copper pipe.
02.15 Join copper tubing to brass pipe.
02.16 Join copper tubing to steel pipe.
02.17 Join copper tubing or pipe to plastic pipe.
02.18 Join ductile and mechanical joint to fit.
02.19 Cut ductile iron.
02.20 Join steel pipe to ductile pipe.
02.21 Join plastic pipe to ductile pipe.
02.22 Braze pipe with a gas torch and filler metal.
02.23 Weld pipe with an oxyacetylene torch and filler metal.
02.24 Join pipe with an electric arc welder and filler metal.

03.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's and engineer's scale.
03.03 Interpret measuring device.
03.04 Identify and define basic symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select material for specifications.

04.0 LAY OUT A JOB--The student will be able to:

04.01 Lay out a job on site.
04.02 Test the underground.
04.03 Select material based on specifications.

05.0 INSTALL FIRST FLOOR AND ABOVE--The student will be able to:

05.01 Lay out a job on site.
05.02 Install hangers and supports.
05.03 Install risers and controls.
05.04 Install water distribution systems.
05.05 Test the pipe rough-in.

06.0 TRIM OUT FIRE PROTECTION SYSTEM--The student will be able to:

06.01 Install and trim out components.
06.02 Test and inspect the final installation.
06.03 Conduct purification tests.

07.0 REPAIR, SERVICE AND MAINTAIN FIRE PROTECTION SYSTEM--The student will be able to:

07.01 Establish positive customer relations.
07.02 Troubleshoot and diagnose systems.
07.03 Determine alternative solutions.
07.04 Repair fire service.
07.05 Repair leaks.
07.06 Repair or replace components.
07.07 Test and inspect repaired systems.
07.08 Prepare a job ticket.
07.09 Price a job and write the invoice.
07.10 Collect for service rendered.

08.0 DEMONSTRATE GENERAL KNOWLEDGE OF FIRE PROTECTION--The student will be able to:

08.01 Explain the purpose of fire protection.
08.02 Apply basic theory and principles of fire protection codes.
08.03 Read and locate information in the Fire Codes.
08.04 Define terminology used in the Fire Code.
08.05 Explain why the Code may supercede manufacturer's specifications on products.

09.0 APPLY WATER SUPPLY REQUIREMENTS FOR SPRINKLER SYSTEM--The student will be able to:

09.01 Conduct a flow test.
09.02 Identify source of water supply.
09.03 Identify requirements of approving utility company.
09.04 Conduct a hydrostatic test.
09.05 Flush underground mains.
09.06 Complete test forms.

10.0 DEMONSTRATE INSTALLATION OF A WET SYSTEM--The student will be able to:

10.01 State the advantages and disadvantages of wet systems.
10.02 Identify types of control valves used in wet systems.
10.03 Place control valves at correct location.
10.04 Describe causes of unsatisfactory performance in a wet system.
10.05 Identify various hazards of wet system installations.
10.06 Identify spacing, location, and position sprinklers.

10.07 Pipe schedule a wet system.
10.08 State advantages of hydraulics designed wet system.
10.09 Test wet system.

11.0 DEMONSTRATE INSTALLATION OF A DRY SYSTEM--The student will be able to:

11.01 State the advantages and disadvantages of dry system.
11.02 Identify types of control valves used in dry systems.
11.03 Place control valves at correct locations.
11.04 Describe causes of unsatisfactory performance in a dry system.
11.05 Describe hazards of dry system installation.
11.06 Identify spacing, location, and position of sprinklers.
11.07 State recommended capacity of dry pipe system in U.S. gallons.
11.08 Pipe schedule a dry system.
11.09 State advantages of a hydraulic designed dry system.
11.10 Describe maximum time for water to reach remote inspector test.
11.11 Identify methods of charging a dry system.
11.12 Describe proper drainage of a dry pipe system and protection of dry valves.
11.13 Test dry system.

12.0 DEMONSTRATE INSTALLATION OF PREACTION AND DELUGE SYSTEM--The student will be able to:

12.01 State advantages and disadvantages of preaction and deluge systems.
12.02 Identify types of control valves used in preaction and deluge systems.
12.03 Place control valves at correct location.
12.04 Describe causes of unsatisfactory performance.
12.05 Identify various hazards of wet system installation.
12.06 Identify spacing, location, and position of sprinklers.
12.07 Pipe schedule a preaction and deluge system.
12.08 State advantages of hydraulics design of a preaction and deluge system.
12.09 Describe most commonly used preaction and deluge systems.
12.10 Describe a supplemental fire detection system.
12.11 Test a supplemental detection system.

13.0 DEMONSTRATE INSTALLATION OF COMBINED DRY PIPE AND PREACTION SYSTEM--The student will be able to:

13.01 State advantages and disadvantages of a combined system.
13.02 Identify types of control valves in a combined system.
13.03 Place control valves at correct location.
13.04 Describe cause of unsatisfactory performance in a combined system.
13.05 Identify hazards of a combined system.
13.06 Pipe schedule a combined system.
13.07 Identify spacing, location, and position of sprinklers.
13.08 State advantages of hydraulics design of a combined system.
13.09 Test a combined system.
13.10 Define a NFPA combined system.
13.11 Name requirements of fire detection installation.

14.0 DEMONSTRATE INSTALLATION OF ANTI-FREEZE SYSTEM--The student will be able to:

14.01 State the advantages and disadvantages of the anti-freeze system.
14.02 Calculate number of heads in relation to a wet system design.
14.03 Identify types of anti-freeze solution.
14.04 Test an anti-freeze solution.
14.05 Identify the purpose and procedures of installing an anti-freeze

loop.
14.06 Test an anti-freeze system.

15.0 DEMONSTRATE INSTALLATION OF STAND-PIPE SYSTEM--The student will be able to:

15.01 Determine the need for a stand-pipe system.
15.02 Determine stand-pipe sizing and number required as per NFPA 14 standard book.
15.03 Evaluate the building design for the stand-pipe classification.
15.04 Identify locations and methods of sectionalizing stand-pipe.
15.05 Determine the GPM required for stand-pipe system.
15.06 Test the stand-pipe system.

16.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

16.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
16.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
16.03 Read and follow written and oral instructions.
16.04 Answer and ask questions coherently and concisely.
16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
16.06 Demonstrate appropriate telephone/communication skills.

17.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

17.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
17.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
17.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
17.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
17.05 Demonstrate an understanding of federal, state and local taxes and their computation.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
18.02 Draw conclusions or make inferences from data.
18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

19.01 Conduct a job search.
19.02 Secure information about a job.
19.03 Identify documents that may be required when applying for a job.
19.04 Complete a job application form correctly.
19.05 Demonstrate competence in job interview techniques.
19.06 Identify or demonstrate appropriate responses to criticism from

employer, supervisor, or other persons.
19.07 Identify acceptable work habits.
19.08 Demonstrate knowledge of how to make job changes appropriately.
19.09 Demonstrate acceptable employee health habits.
19.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

20.01 Define entrepreneurship.
20.02 Describe the importance of entrepreneurship to the American economy.
20.03 List the advantages and disadvantages business ownership.
20.04 Identify the risks involved in ownership of a business.
20.05 Identify the necessary personal characteristics of a successful entrepreneur.
20.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Floor Covering Installation

CODE NUMBER: Secondary 8721400 Postsecondary I460405

Florida CIP 0646.040500

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G FLOORING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a floor covering installer, or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, classroom instruction and shop experiences in the preparation of floors for the layout, measuring, cutting, sewing, of sound-deadening or decorative covering for floors and walls. The preparation of floors for, and the layout, measuring, cutting and installation of linoleum and vinyl sheet floor covering and tile are included.

Listed below are the courses that comprise this program when offered at the secondary level:

8721410	Floor Covering Installation 1
8721420	Floor Covering Installation 2
8721430	Floor Covering Installation 3

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the basic hand tools and equipment including knee kickers, seaming irons, power stretchers, strippers, tile cutters, hand binding staplers, and hammer drills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade

level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate safe and efficient work practices.
02. Interpret blueprints and specifications.
03. Select, care for and use tools and materials.
04. Demonstrate sketching, measuring, and drawing proficiency.
05. Demonstrate knowledge of material and cost estimates.
06. Demonstrate knowledge of current industry standards, practices and techniques.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate math skills.
09. Demonstrate appropriate understanding of basic science.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8721400

PROGRAM TITLE: Floor Covering Installation POSTSECONDARY NUMBER: I460405

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Identify commonly used tools and safety practices.
01.02 Demonstrate proper methods of lifting and carrying.
01.03 Explain safety rules to be followed at all times.

02.0 INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

02.01 Identify commonly used symbols.
02.02 Determine area from dimensions given on prints.

03.0 SELECT, CARE FOR AND USE TOOLS AND MATERIALS--The student will be able to:

03.01 Demonstrate use of cutting and seaming tools.
03.02 Demonstrate use of carpet installation tools.
03.03 Demonstrate the proper method for installation floor covering with mastic.

04.0 DEMONSTRATE SKETCHING, MEASURING, AND DRAWING PROFICIENCY--The student will be able to:

04.01 Measure an area and complete floor covering requirements.
04.02 Perform an installation survey to develop sketches and notes for sequence of installation.

05.0 DEMONSTRATION KNOWLEDGE OF MATERIAL AND COST ESTIMATES--The student will be able to:

05.01 Solve material and cost estimating problems.
05.02 Maintain service, installation and time records.
05.03 Write a field report on apparent faulty product.

06.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS PRACTICES AND TECHNIQUES--The student will be able to:

06.01 Demonstrate understanding of carpet laying terminology.
06.02 Explain the importance of good customer relations.
06.03 Explain the new trends in the use of floor covering materials.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 1 COURSE NUMBER: 8721410

COURSE DESCRIPTION:

This course is designed to provide instruction in the proper, safe use and care of hand and power tools related to floor covering trades. Installation of Mastic Applied floor covering is included.

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Identify commonly used tools and safety practices.
01.02 Demonstrate proper methods of lifting and carrying.
01.03 Explain safety rules to be followed at all times.

03.0 SELECT, CARE FOR AND USE TOOLS AND MATERIALS--The student will be able to:

03.01 Demonstrate use of cutting and seaming tools.
03.02 Demonstrate use of carpet installation tools.
03.03 Demonstrate the proper method for installation floor covering with mastic.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

09.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
09.02 Draw conclusions or make inferences from data.
09.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
09.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation

PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 2

COURSE NUMBER: 8721420

COURSE DESCRIPTION:

This course is designed to provide instruction in the identification of commonly used symbols and determining area from dimensions given on blueprints, carpet laying terminology, trends in floor covering and customer relations.

02.0 INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

02.01 Identify commonly used symbols.
02.02 Determine area from dimensions given on prints.

06.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS PRACTICES AND TECHNIQUES--The student will be able to:

06.01 Demonstrate understanding of carpet laying terminology.
06.02 Explain the importance of good customer relations.
06.03 Explain the new trends in the used of floor covering materials.

08.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

08.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
08.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
08.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
08.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
08.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation

PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 3

COURSE NUMBER: 8721430

COURSE DESCRIPTION:

This course is designed to provide instruction in material and cost estimates, develop job sketches and drawings, service, installation and time records.

04.0 DEMONSTRATE SKETCHING, MEASURING, AND DRAWING PROFICIENCY--The student will be able to:

04.01 Measure an area and complete floor covering requirements.
04.02 Perform an installation survey to develop sketches and notes for sequence of installation.

05.0 DEMONSTRATION KNOWLEDGE OF MATERIAL AND COST ESTIMATES--The student will be able to:

05.01 Solve material and cost estimating problems.
05.02 Maintain service, installation and time records.
05.03 Write a field report on apparent faulty product.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.
10.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July 1993

PROGRAM TITLE: Frame and Form Carpentry

CODE NUMBER: Secondary 8722200 Postsecondary ______

Florida CIP 0646.021102

SECONDARY SCHOOL CREDITS __x__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30,31

CERTIFICATION COVERAGE: TEC CONSTR @7G CARPENTRY @7G BLDG CONST @7G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as carpenters (87102541) or frame and form carpenter helpers (869.664-014).

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, laying out, repairing, and fabricating and erecting residential wooden structures and fixtures using hand tools and power tools.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program to provide instruction in use of hand and power tools, selection and use of materials, estimating, and blueprint reading.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences;a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

Completion of the Carpentry Skills Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization. area concurrently may be necessary.

IV. INTENDED OUTCOMES: After successfully completing this program, the

student will be able to:

01. Demonstrate knowledge of form construction.
02. Cut and install framing members for a floor.
03. Cut and install a wall and partition framing.
04. Frame a roof.
05. Install and brace roof trusses.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8722200

PROGRAM TITLE: Frame and Form Carpentry
POSTSECONDARY NUMBER:

01.0 DEMONSTRATE KNOWLEDGE OF FORM CONSTRUCTION--The student will be able to:

01.01 Identify characteristics and types of forms.
01.02 Install inbeds for various form.
01.03 Identify styles of footings.
01.04 Construct and set forms for a continuous form.
01.05 Construct and set forms for a pile cap.
01.06 Construct and set a pier footing form.
01.07 Strip a form for relocation.

02.0 CUT AND INSTALL FRAMING MEMBERS FOR A FLOOR--The student will be able to:

02.01 Identify framing members.
02.02 Build box sill and install floor joist.
02.03 Install bridging.
02.04 Lay subfloor.
02.05 Install floor joists for cantilever floor.

03.0 CUT AND INSTALL A WALL AND PARTITION FRAMING--The student will be able to:

03.01 Identify framing members used in wall and partition construction.
03.02 Layout wall lines and partition locations on floor.
03.03 Cut studs, trimmers, cripples, headers and firestops to length.
03.04 Build T's, corners and headers.
03.05 Layout and assemble wall sections.
03.06 Install wall sheathing.

04.0 FRAME A ROOF--The student will be able to:

04.01 Identify roof members.
04.02 Identify roof styles.
04.03 Identify roof framing units.
04.04 Compute length of common hip and jack rafters.
04.05 Layout rafter and ceiling hoist location on plate and ridge on center.
04.06 Layout, cut and erect rafters.
04.07 Install roof sheathing.
04.08 Install asphalt composition strip shingles.

05.0 INSTALL AND BRACE ROOF TRUSSES--The student will be able to:

05.01 Identify the main parts of trusses.
05.02 Identify hardware used in truss construction.
05.03 Describe the installation and bracing of trusses.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Frame and Form Carpentry

PROGRAM NUMBER: 8722200

COURSE TITLE: Frame and Form Carpentry

COURSE NUMBER: 8722200

COURSE DESCRIPTION:

01.0 DEMONSTRATE KNOWLEDGE OF FORM CONSTRUCTION--The student will be able to:

01.01 Identify characteristics and types of forms.
01.02 Install inbeds for various form.
01.03 Identify styles of footings.
01.04 Construct and set forms for a continuous form.
01.05 Construct and set forms for a pile cap.
01.06 Construct and set a pier footing form.
01.07 Strip a form for relocation.

02.0 CUT AND INSTALL FRAMING MEMBERS FOR A FLOOR--The student will be able to:

02.01 Identify framing members.
02.02 Build box sill and install floor joist.
02.03 Install bridging.
02.04 Lay subfloor.
02.05 Install floor joists for cantilever floor.

03.0 CUT AND INSTALL A WALL AND PARTITION FRAMING--The student will be able to:

03.01 Identify framing members used in wall and partition construction.
03.02 Layout wall lines and partition locations on floor.
03.03 Cut studs, trimmers, cripples headers and firesteps to length.
03.04 Build T's, corners and headers.
03.05 Layout and assemble wall sections.
03.06 Install wall sheathing.

04.0 FRAME A ROOF--The student will be able to:

04.01 Identify roof members.
04.02 Identify roof styles.
04.03 Identify roof framing units.
04.04 Compute length of common hip and jack rafters.
04.05 Layout rafter and ceiling hoist location on plate and ridge on center.
04.06 Layout, cut and erect rafters.
04.07 Install roof sheathing.
04.08 Install asphalt composition strip shingles.

05.0 INSTALL AND BRACE ROOF TRUSSES--The student will be able to:

05.01 Identify the main parts of trusses.
05.02 Identify hardware used in truss construction.
05.03 Describe the installation and bracing of trusses.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Gas Service, Installation, and Repair

CODE NUMBER: Secondary ______ Postsecondary I470499

Florida CIP 0647.049901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__Other __30, 31__

CERTIFICATION COVERAGE: APPLI REPR @ 7 G GAS FITTER @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as gas appliance repairers (85944649), plant utility persons (953.382-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: blueprint reading; applicable building codes; and installation and repair procedures. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: installation, maintenance and repair of lines, meters and controls.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other. This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate a proficiency in liquefied petroleum gas operations and safety.
02. Demonstrate a proficiency in liquefied petroleum gas transportation and delivery.
03. Demonstrate a proficiency in liquefied petroleum gas tanks, cylinders and equipment.
04. Demonstrate a proficiency in liquefied petroleum gas liquid and vapor distribution systems and equipment.
05. Demonstrate a proficiency in liquefied petroleum gas liquid transfer systems and equipment.
06. Demonstrate a proficiency in using liquefied petroleum gas as a motor fuel.
07. Demonstrate a proficiency in liquefied petroleum gas appliance maintenance.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Gas Service, Installation, and Repair POSTSECONDARY NUMBER: I470499

01.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS (LPG) OPERATIONS AND SAFETY--The student will be able to:

01.01 Determine the primary tasks required to perform your job.
01.02 Determine the primary training that you must complete to perform your job.
01.03 Select the proper GUIDEBOOKS on performing the tasks in your job.
01.04 Trace the history of the LPG industry.
01.05 Identify the primary sources of LPG.
01.06 Identify the major blends of LPG used by the industry today.
01.07 List the physical properties of LPG.
01.08 Explain the effect of heat and pressure on the boiling point of liquids.
01.09 Explain the way LPG behave when they are stored in a tank or cylinder.
01.10 Explain the characteristics of LPG combustion.
01.11 Identify the major categories of customers in the LPG industry.
01.12 Identify the categories of customers served by your company.
01.13 Identify the LPG applications in each customer category serviced by your company.
01.14 Identify the basic parts of a Department of Transportation (DOT)/Interstate Commerce Commission (ICC) cylinder installation.
01.15 Identify the basic parts of an American Society of Manufacturing Engineers (ASME) tank installation.
01.16 Identify the basic parts of the bulk plant storage tank.
01.17 Identify the basic parts of the unloading station at the bulk plant.
01.18 Identify the basic parts of the filling or dispensing stations at the bulk plant.
01.19 State the purpose and objectives of state and national LPG industry associations.
01.20 Explain the various manufacturing standards that apply to the LPG industry.
01.21 Explain the purpose of independent testing laboratories that apply to the LPG industry.
01.22 Name the various LPG operations and fire safety codes that apply to your area or locale.
01.23 Explain the agencies that enforce regulations in your area or locale.
01.24 State the driver qualifications for specific motor vehicle operations.
01.25 State the drive maintenance required for general and specific motor vehicles.
01.26 State the rules for defensive driving.
01.27 State the proper rules to follow in the event of an accident.
01.28 Lit the precautions to follow when working at the plant.
01.29 List the precautions to follow for personal safety on the job.
01.30 List the general accident prevention techniques for fire safety.
01.31 List the general accident prevention techniques for hazardous material safety.
01.32 List the general accident prevention techniques for machinery and mechanical safety.
01.33 List the general accident prevention techniques for electrical safety.
01.34 List the general accident prevention techniques for material

handling safety.
01.35 List the general accident prevention techniques for climbing safety.
01.36 Identify the two major hazards when working with LPG.
01.37 Identify the sources of LPG leaks, spills and discharges associated with your job.
01.28 List the precautions to be taken to avoid LPG leaks, spills, and discharges associated with your job.
01.39 List the precautions to be observed in handling an LPG leak, spill or discharge in your job.
01.40 Identify the causes of a boiling liquid expanding vapor explosion (BLEVE).
01.41 Identify the different ignition sources that may be present in your job that could cause a fire.
01.42 Identify the different flammable materials that you may use in your job.
01.43 List the precautions that should be observed to avoid fires.
01.44 List the precautions that should be observed in handling fires.
01.45 Identify the various types of hand tools.
01.46 Explain the purpose of each type of hand tool.
01.47 Explain the proper way to use each hand tool.
01.48 Explain the proper way to care for each hand tool.
01.49 Identify various sections of pipe according to material, size, and schedule.
01.50 Identify various sections of tubing according to material, size and schedule.
01.51 Identify and describe the purpose of various pipe and tube fitting.s
01.52 Select and use the proper tools for holding, cutting and threading pipe, as well as making a threaded pipe connection.
01.53 Select and use the proper tools for cutting, bending and flaring tubing, as well as making a flared tube connection.
01.54 Explain the importance of the customer to LPG operations.
01.55 Explain how knowing the needs of your customers helps to develop a good relationship with them.
01.56 Explain how developing the right attitude helps to develop a good relationship with customers.
01.57 Explain how knowing your own limitations helps to develop a good relationship with customers.
01.58 Explain how looking like a professional helps to develop a good relationship with customers.
01.59 Explain how conducting yourself like a professional helps to develop a good relationship with customers.
01.60 Explain how doing your job properly helps to develop a good relationship with customers.

02.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS TRANSPORTATION AND DELIVERY--The student will be able to:

02.01 Determine your particular job responsibilities.
02.02 Obtain your company operating procedures covering your job responsibilities.
02.03 Select the appropriate chapters in this GUIDEBOOK that you need to read to accomplish your job.
02.04 Explain the characteristics of LPG that affects its transfer with pumps.
02.05 Identify the major parts of a pump.
02.06 Explain the principles of transferring LPG with a pump.
02.07 Identify the major parts of a pump network.
02.08 Describe the types of operator maintenance required on pump networks.
02.09 Identify the major parts of LPG compressors and compressor

protection devices.
02.10 Explain the procedures involved in compressor operations, including vapor recovery.
02.11 Explain the principles of efficient compressor operation.
02.12 List the basic requirements for compressor maintenance.
02.13 Identify the types of transfer lines used in an LPG transfer network.
02.14 Identify a liquid withdrawal valve used in an LPG transfer network.
02.15 Identify the types of manual shutoff valves used in a transfer network.
02.16 Identify an in-line automatic check valve used in a transfer network.
02.17 Identify a flow monitor used in a transfer network.
02.18 Identify a bulkhead and the emergency shutoff valves in a transfer network.
02.19 Identify the types of hose-end valves used in a transfer network.
02.20 Explain the basic guidelines for "pre-fill" inspections of the transfer equipment, container and the transfer site.
02.21 Determine the maximum permitted filling level for containers filled by weight and by volume.
02.22 Locate and identify container fill connections and fittings.
02.23 Explain the principles of filling, including the use of vapor equalization lines.
02.24 Point out the location and explain the use of the valves and gages installed on transports and tank cars.
02.25 Point out and explain the use of the safety equipment installed on transports and at unloading bulkheads and risers.
02.26 Inspect the transfer area for obstructions and hazards.
02.27 Guide the transport into position at the bulkhead and inspect it for damage.
02.28 Check, test and gage the contents of the transport tank.
02.29 Determine the maximum amount of LPG to be transferred into the plant storage tanks.
02.30 Connect liquid and vapor hoses between the transport and the plant bulkhead.
02.31 Unload the transport tank.
02.32 Prepare the transport for departure.
02.33 Secure a tank car for unloading.
02.34 Inspect the tank car.
02.35 Gauge and test the contents of the tank car.
02.36 Determine the maximum amount of LPG to be transferred to the plant storage tanks.
02.37 Connect liquid and vapor hoses between the tank car and the riser.
02.38 Prepare the tank car for departure.
02.39 Identify the valving and major features on portable cylinders.
02.30 Identify the valving and major features on exchange cylinders.
02.41 Identify the valving and major features on lift truck cylinders.
02.42 Identify the valving and major features on stationary cylinders.
02.43 Identify the valving and major features on motor fuel and RV tanks.
02.44 Identify the valving and major features on stationary tanks, including tanks at dispensing stations and multi-tank installations.
02.45 Determine when a DOT/ICC cylinder needs to be reinspected by reading the inspection date stamped on it.
02.46 Explain the safety precautions that apply to tank and cylinder filling operations at a dispensing station.
02.47 Inspect and maintain the transfer equipment at your dispensing station.
02.48 Inspect the transfer site and the container to be filled.
02.49 Prepare the container for filling.

02.50 Select the proper adaptor and connect the filler hose to the container.
02.51 Fill the container accurately by weight or by volume.
02.52 Bleed down and disconnect the filler hose.
02.53 Carry out post-filling inspections and procedures.
02.54 Explain the general safety precautions that apply to cylinder delivery operations.
02.55 Inspect cylinder delivery trucks and cylinder delivery equipment.
02.56 Identify the placarding requirements for cylinder delivery vehicles.
02.57 Inspect, load and secure cargo.
02.58 Inspect storage areas at industrial sites and residential cylinder installations.
02.59 Exchange full for empty cylinders at industrial and residential sites.
02.60 Point out and describe the important parts of a bulk truck cargo tank.
02.61 Point out and describe the valves used control the flow of LPG into and out of the cargo tank.
02.62 Point out and describe the equipment in a bulk truck pump circuit.
02.63 Complete a pre-trip inspection of a bulk truck.
02.64 Position the bulk truck for filling.
02.65 Set the liquid level gage(s) on the bulk truck tank.
02.66 Connect the fill and vapor equalizing hoses to the bulk truck tank.
02.67 Fill the bulk truck tank.
02.68 Disconnect the hoses and prepare the truck for travel.
02.69 Select a route to the customer container.
02.70 Position the bulk truck for filling the customer container.
02.71 Inspect the container to be sure that it is suitable for LPG service.
02.72 Connect the fill hose and, if applicable, the vapor equalizing hose to the customer container.
02.73 Fill the customer container.
02.74 Disconnect the hose(s) from the customer container.
02.75 Prepare the bulk truck for your next delivery.
02.76 Select the proper equipment for evacuating or unloading a stationary ASME tank.
02.77 Determine the quantity of LPG to be evacuated.
02.78 Locate and position all equipment at the evacuation site.
02.79 Connect all necessary hoses, fittings and equipment.
02.80 Pressure test all hoses and fittings.
02.81 Evacuate the container.
02.82 Bleed down and disconnect all hoses.
02.83 Explain the regulations and safety precautions you must observe when parking LPG delivery vehicles.
02.84 Explain the regulations and safety precautions you must observe when garaging LPG delivery vehicles for maintenance or repairs.

03.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS TANKS, CYLINDERS AND EQUIPMENT--The student will be able to:

03.01 Identify the major parts of an ASME tank.
03.02 Identify and explain the basic markings of an ASME tank.
03.03 Identify the type of service and application of an ASME tank.
03.04 Identify the major parts of a DOT or ICC cylinder.
03.05 Identify and explain the required markings on DOT and ICC cylinders.
03.06 Identify the types of service and normal applications of DOT or ICC cylinders used in LPG service.
03.07 Identify the major parts of a DOT portable tank, cargo tank and rail car tank.

03.08 Explain the DOT design markings on a DOT portable tank, cargo tank and rail car tank.
03.09 Identify the type of service or application of a DOT cargo tank and rail car tank.
03.10 Identify the major parts of a spring-loaded safety relief valve.
03.11 Explain the operation of a spring-loaded safety relief valve.
03.12 Explain design markings on a spring-loaded safety relief valve.
03.13 Select and size a safety relief valve for a LPG container.
03.14 Identify the parts of a temperature gage, pressure gage and liquid level gage.
03.15 Determine the proper application of a temperature gage, pressure gage and liquid level gage.
03.16 Select a pressure gage for a LPG container.
03.17 Select a liquid level gage for a LPG container.
03.18 Identify the parts of a filler valve, equalizing valve and withdrawal valve.
03.19 Determine the proper application of filler valves, equalizing valves and withdrawal valves.
03.20 Select a filler valve, equalizing valve and withdrawal valve for an ASME stationary tank.
03.21 Disassemble and identify the major parts of a service valve and a combination service valve.
03.22 Select the proper service valve for a DOT/ICC exchange cylinder and a cylinder filled on-site.
03.23 Select the proper service valve for an ASME stationary tank and mobile tank.
03.24 Size an stationary ASME tank for vapor withdrawal.
03.25 Size exchange cylinders for vapor withdrawal.
03.26 Size a stationary ASME tank for liquid withdrawal.
03.27 Select the proper equipment for evacuating or unloading a stationary ASME tank.
03.28 Locate and position all equipment at the evacuation site.
03.29 Connect all necessary hoses, fittings and equipment.
03.30 Pressure test all hoses and fittings.
03.31 Determine the quantity of LPG to be evacuated.
03.32 Evacuate the container.
03.33 Bleed down and disconnect all hoses.
03.34 Evacuate as much LPG liquid from the container as possible (by pump, compressor, "gravity", etc.) in preparing for "flaring".
03.35 Select the proper site for flaring the remaining LPG in the container.
03.36 Select the proper equipment for flaring the remaining LPG in the container.
03.37 Connect all necessary hoses, fittings, burners, etc. for flaring.
03.38 Pressure test the flaring hoses, fittings, etc..
03.39 Flare the remaining LPG in the container.
03.40 Bleed down and disconnect all hoses, fittings, burners,etc..
03.41 Select the proper valves and accessories needed for container installation.
03.42 Prepare the valves and accessories for installation.
03.43 Prepare the container opening for the valve or gage installation.
03.43 Apply thread sealing compound to male threads of the valve, gage or adaptor.
03.44 Apply thread sealing compound to male threads of the valve, gage or adaptor.
03.45 Install the container valve, gage or adaptor and any necessary accessories.
03.46 Neutralize water moisture inside tanks and cylinders in preparing them for installation.
03.47 Purge air from the inside of tanks and cylinders in preparing them for installation.
03.48 Pressure test the tanks and cylinders to ensure that it is free

from leaks (gas tight).

03.49 Evacuate or unload all ammonia from a nurse tank in preparing it for LPG service.

03.50 Completely purge the nurse tank with water.

03.51 Replace container valves (if necessary).

03.52 Purge the tank with LPG vapor.

03.53 Test the LPG vapor for ammonia contamination.

03.54 Remark the container according to federal, state and local codes for LPG service (if necessary).

03.55 Size the ASME tank for the total effective load of the appliances.

03.56 Select a location for the tank at the customer site.

03.57 Select and prepare the tank, equipment and tools for the installation.

03.58 Deliver the tank to the customer location.

03.59 Prepare a foundation or base for the tank.

03.60 Install the tank on the foundation.

03.61 Prepare the tank for service.

03.62 Explain any customer maintenance or safety precautions to the customer.

03.63 Size replaceable and stationary DOT/ICC cylinders for installation according to the total effective load of the appliances.

03.64 Select a location for the cylinder(s) to be installed at the customer site.

03.65 Select and prepare the cylinder(s), equipment and tools for installation at the customer site.

03.66 Deliver the cylinder(s) for installation at the customer site.

03.67 Prepare a foundation or base for the installation of the cylinder(s) at the customer site.

03.68 Install the cylinder(s) on the foundation and prepare the cylinder(s) for service.

03.69 Explain any customer maintenance or safety precautions to the customer.

03.70 Determine the inspection and maintenance requirements for various LPG containers.

03.71 Properly inspect and LPG container to determine if it is suitable for continued service.

03.72 Determine the proper procedures to follow in order to correct any problem found during the inspection.

03.73 Perform visual inspection and requalification of DOT/ICC cylinders in accordance with centimeter-gram-second (CGS) procedures.

03.74 Determine the type of requalification required for a DOT/ICC cylinder.

03.75 Record all important information on an inspection form.

03.76 Prepare the cylinder for inspection.

03.77 Inspect the cylinder for fire damage and general distortion.

03.78 Inspect the neck of the cylinder for damage.

03.79 Inspect all parts for general damage (i.e., foot ring, data plate, etc.).

03.80 Weigh the cylinder

03.81 Inspect the cylinder for dents.

03.82 Inspect the cylinder for cuts, gouges, digs and corrosion.

03.83 Pressure test the cylinder with LPG vapor.

03.84 Stamp the retest date on the neck ring or data plate of the cylinder.

03.85 Inspect, service and maintain pressure gages, liquid level gages in a stationary ASME tank.

03.86 Inspect, service and maintain safety relief valves, fill valves and service valves in a stationary ASME tank.

03.87 Inspect a service valve on a replaceable DOT cylinder.

03.88 Clean and repair the LPG tank or cylinder surface for painting.

03.89 Select and apply a primer, special coating or finish coat (if necessary).

03.90 Determine the required general markings for an ASME bulk tank.
03.91 Mark the tank (if necessary).
03.92 Determine the proper marking, labeling and placarding for a DOT/ICC cylinder, portable tank, cargo tank and tank car.

4.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS LIQUID AND VAPOR DISTRIBUTION SYSTEMS AND EQUIPMENT--The student will be able to:

04.01 Determine the purpose and major parts of a LPG regulator.
04.02 Explain the basic operation of a regulator.
04.03 Determine the two basic types of regulator systems.
04.04 Determine the various applications for the basic types of regulator systems.
04.05 Identify the common types of distribution line materials approved for use with LPG.
04.06 Select the types of pipe and fittings which can be used with the different categories of system pressures.
04.07 Select the types of tube and fittings which can be used with the different categories of system pressures.
04.08 Name and describe an approved low pressure flexible (appliance) connectors.
04.09 Name and describe two common types of high pressure flexible connectors.
04.10 Select the type of regulator system needed for the installation.
04.11 Calculate the total appliance demand of the installation.
04.12 Determine the required delivery or outlet pressure needed for the installation.
04.13 Determine the expected minimum inlet pressure to the regulator(s).
04.14 Obtain the manufacturer's flow capacity rating for the regulator.
04.15 Select the correct regulator(s) for the installation (using the manufacturer's literature).
04.16 Make a sketch of the entire distribution system including the location of the container(s) and appliance(s).
04.17 Determine the length of the longest section of line through which the operating pressure must be maintained.
04.18 Determine the operating pressure(s) and required flow capacities of all lines in the distribution system.
04.19 Select the appropriate tables for sizing the distribution lines.
04.20 Select the proper size for the distribution line(s) (using the appropriate table(s)).
04.21 Locate the forms and sketches used by your company to plan a vapor distribution line.
04.22 Plan the routing for the distribution lines in an installation that includes: outside lines; lines passing through outside walls; lines passing through inside walls, ceilings and floors; and inside lines.
04.23 Select the materials, fittings and special protection needed for: outside lines; lines passing through outside walls; inside lines; and lines passing through inside walls, ceilings and floors.
04.24 Determine the proper lengths of pipe between various types of fittings.
04.25 Plan a liquid distribution line.
04.26 Make a rough sketch of the installation for a liquid distribution line.
04.27 Determine the required flow rate for the liquid distribution line.
04.28 Calculate an average flow resistance for the valves and fittings in the liquid distribution line.
04.29 Based on the average flow resistance for the valves and fittings, select a "trial" pipe size for the distribution line.
04.30 Based on the "trial" pipe size, determine the exact flow resistance for the distribution line.
04.31 Select the proper regulator(s) for a typical installation.

04.32 Select any necessary accessories needed for the regulator.
04.33 Select the required materials needed to install the regulator.
04.34 Select a mounting bracket and any other materials to firmly support the regulator.
04.35 Install the regulator mounting bracket and post.
04.36 Install the regulator and supply manifold into the distribution line.
04.37 Install any required regulator accessories.
04.38 Plan an outdoor and indoor distribution system.
04.39 Install the outside distribution system.
04.40 Install the outside wall penetration line.
04.41 Install the inside distribution lines.
04.42 Install all inside floor or wall penetration lines and gas outlets.
04.43 Pressure test the distribution system to be sure that it is gas tight.
04.44 Purge the air (or inert gas) from the distribution line.
04.45 State the types of inspections that you should perform in a vapor distribution system.
04.46 State the types of repairs that you may have to perform in a vapor distribution system.
04.47 Use a troubleshooting guide to locate and correct problems in a vapor distribution system.
04.48 Identify the major parts of a diaphragm vapor meter.
04.49 Explain the basic operation of a diaphragm vapor meter.
04.50 Read the two most common types of meter indexes.
04.51 Explain the effects of temperature and pressure on meter accuracy.
04.52 Select and size a meter for an LPG vapor distribution system.
04.53 Select a location for installing a vapor meter.
04.54 Select a vapor meter for the installation.
04.55 Select the materials and accessories needed to install the vapor meter.
04.56 Prepare the vapor meter for installation.
04.57 Install any required mounting hardware.
04.58 Place the meter into service.
04.59 Determine the purpose and major parts of a vaporizer.
04.60 Explain the basic operation of a vaporizer.
04.61 Select the correct vaporizer for a particular installation from a manufacturer's catalog.
04.62 Install a vaporizer system.
04.63 Perform a service check on a vaporizer system.

05.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS LIQUID TRANSFER SYSTEMS AND EQUIPMENT--The student will be able to:

05.01 Name the types of pumps used in LPG service.
05.02 Identify the parts of LPG pumps and explain their purpose.
05.03 Explain the principles of efficient pump operation and the major factors that affect pump performance.
05.04 Properly size and select a pump to replace existing equipment.
05.05 Identify common pump protective devices such as strainers, flexible connectors, hydrostatic relief valves and pump bypass valves.
05.06 Explain the design and operation of internal safety relief valves, differential pressure valves and manual and automatic bypass circuits.
05.07 Explain the criteria for sizing, installing and inspecting pump protective devices.
05.08 Explain the structure and function of the various parts of LPG meters, including the measuring chamber, gear train, temperature compensator and register.
05.09 Explain the structure and operation of strainers, vapor

eliminators, differential valves and other metering system components.

05.10 Explain the criteria for sizing, selecting and installing LPG metering systems.

05.11 Explain the inspection and maintenance requirements for LPG meters and metering systems, including the requirements for periodic testing and recalibration.

05.12 Explain the structure and operation of the various parts of LPG compressors, including the cooling and lubrication systems, drive system and valve and piston assemblies.

05.13 Explain the structure and function of the inlet strainer, liquid trap and other compressor protection devices.

05.14 Explain the structure and function of manifold valving, four-way valves and other components that control the flow of liquid and vapor during compressor operations.

05.15 Explain the criteria for sizing and selecting LPG compressors and compressor drive systems.

05.16 Explain the operating parameters and inspection and maintenance requirements for LPG compressors and compressor transfer systems.

05.17 Identify and explain the operation of the different types of manual shutoff valves.

05.18 Identify and explain the operation of transfer line automatic check valves.

05.19 Identify various flow indicators in the transfer network.

05.20 Explain the proper maintenance procedures for shutoff valves, automatic check valves and flow indicators.

05.21 Order replacement parts for manual shutoff valves and automatic check valves.

05.22 Explain the function and operation of the different types of withdrawal valves.

05.23 Identify the major components of withdrawal valves.

05.24 Identify the major components of with drawal valves.

05.25 Order replacement parts for withdrawal valves.

05.26 Identify the type of hose used in LPG transfer networks.

05.27 Identify the major component parts of hose reels and hose assemblies, including hose fittings, hose end valves and hose end valve adaptors.

05.28 Perform routine inspections and maintenance of hose assemblies and related LPG equipment.

05.29 Properly size and select replacement hoses, hose end valves and other related equipment.

05.30 Identify the types of cylinder filling equipment.

05.31 Identify the major components of the various cylinder filling stations.

05.32 Inspect filling systems for problems and defects.

05.33 Explain the proper maintenance procedures for cylinder filling equipment.

05.34 Order replacement parts for cylinder filling equipment.

05.35 Identify and discuss the shear fittings and various components of bulkheads installed at your facility.

05.36 Identify and explain the operation of emergency shutoff valves installed at your facility.

05.37 Identify and explain the operation of the remote closures devices, both manual and automatic, installed at your facility.

05.38 Order spare parts for the bulkheads and emergency shutoff valved installed at your facility.

05.39 Perform maintenance on the bulkheads and emergency shutoff valves installed at your facility.

05.40 Establish and conduct routine inspection procedures.

05.41 Identify potential problems in the transfer system.

05.42 Identify potential safety hazards in transfer system.

05.43 Perform preventative maintenance procedures.

05.44 Explain the general guidelines for ensuring good pump performance.
05.45 Explain the major causes of pump trouble and recognize their symptoms.
05.46 Use a troubleshooting chart and pressure gages to locate and correct problems in pumping and metered delivery systems.
05.47 Explain the major causes of meter trouble and recognize their symptoms.
05.48 Use a troubleshooting chart to locate and correct meter problems.
05.49 Explain the general guidelines for ensuring efficient compressor operation.
05.50 Explain the major causes of compressor trouble and recognize their symptoms.
05.51 Use a troubleshooting chart and available instrumentation to locate and correct problems in compressor systems.
05.52 Properly isolate in a transfer line the LPG equipment that is in need of repair.
05.53 Safely bleed down and purge the LPG in the isolated equipment.
05.54 Properly remove and service a strainer, a valve and other items of LPG equipment.
05.55 Safely reinstall the LPG equipment in the transfer line.
05.56 Test the transfer system for leaks and return it to service.

06.0 DEMONSTRATE A PROFICIENCY IN USING LIQUEFIED PETROLEUM GAS AS A MOTOR FUEL--The student will be able to:

06.01 Review the history of LPG as a motor fuel.
06.02 Explain the basic physical properties of LPG.
06.03 Compare the fuel characteristics of LPG with gasoline and diesel fuel.
06.04 Explain how the use of LPG in an internal combustion engine affects performance, fuel economy, emissions and engine maintenance.
06.05 Explain why it is important to inspect an engine prior to converting it to run on propane and what items to check.
06.06 Explain how LPG affects the valves and what modifications may be need to minimize valve wear for certain applications.
06.07 Explain how piston ring seating is affected by LPG and how to deal with the question of breaking in a new or rebuilt engine.
06.08 Explain why the engine's compression ratio is important and the bearing it has on performance.
06.09 Explain how engine and intake manifold cooling affect performance when using LPG and why some modification may or may not be needed.
06.10 Explain why it is important to inspect the ignition system, how to check its performance and how to upgrade it where necessary.
06.11 Explain how ignition timing and advance should be modified for LPG.
06.12 Explain what changes to the spark plugs may be necessary and how to "read" the plugs.
06.13 List by name the main components of an LPG fuel system and be able to explain what each component does.
06.14 Explain the basic differences between straight and dual-fuel propane conversion.
06.15 Describe basic fuel tank design.
06.16 Describe the various fuel tank safety features.
06.17 List the steps in fuel tank installation.
06.18 Describe fuel lines, the standards that apply to the materials used and fuel line installation.
06.19 Identify and explain the function of fuel locks, the different types and how they are installed and serviced.
06.20 Explain the function of fuel filters, why they are necessary, how they should be installed and how to service them.
06.21 Identify the vaporizer-regulator and explain how it works.

06.22 Install a vaporizer-regulator.
06.23 Troubleshoot common vaporizer problems.
06.24 Explain fuel metering theory.
06.25 List the basic types of air-fuel mixers and explain how they work.
06.26 Determine the correct size air-fuel mixer for a given engine application.
06.27 List the preliminary steps that must be taken prior to installing any fuel system components.
06.28 List the engine/ignition/cooling system modifications that may be required for a conversion.
06.29 Explain the installation procedures for the various LPG fuel system components.
06.30 Explain what must also be done after the fuel system components have been installed to complete the conversion.
06.31 Review the preliminary steps that must be performed prior to installing any fuel system components.
06.32 Explain what engine/ignition system modifications should and should not be made in a dual fuel conversion.
06.33 Explain what modifications must be made to the gasoline fuel system.
06.34 Review the installation procedure for the dual fuel LPG fuel system components.
06.35 Explain what else must be done after the fuel system has been installed to complete the conversion.
06.36 List the items that should be checked and adjusted after completing a propane conversion and when performing a normal tune up.
06.37 Review the basic ignition timing and advance checks that must be performed.
06.38 Explain how to adjust the engine idle speed, power fuel mixture, and idle fuel mixture for best engine performance.
06.39 Follow manufacturer's adjustment and timing instructions for various types of LPG carburetion equipment.
06.40 Diagnose common fuel system problems.
06.41 Describe the causes for various fuel system problems.
06.42 Correct various fuel system problems.
06.43 Describe the special safety rules that apply to lift trucks.
06.44 Describe the unique aspects of a lift truck fuel system.
06.45 Diagnose some common lift truck fuel problems.
06.46 Correct common lift truck fuel problems.
06.47 Describe the unique requirements of an industrial engine fuel system.
06.48 Explain the special safety rules that apply to these applications.

07.0 DEMONSTRATE A PROFICIENCY IN LIQUEFIED PETROLEUM GAS APPLIANCE MAINTENANCE--The student will be able to:

07.01 Make operating systems check of gas appliances and verify proper operation.
07.02 Instruct customer in proper operation and care.
07.03 Read and interpret schematics and block diagrams.
07.04 Determine the defective status of bearing assemblies.
07.05 Troubleshoot bearing assemblies.
07.06 Remove and replace bearing assemblies or components.
07.07 Determine the defective status of belts.
07.08 Troubleshoot belts.
07.09 Remove and replace belts or components.
07.10 Determine the defective status of door locks.
07.11 Troubleshoot door locks.
07.12 Remove and replace door locks or components.
07.13 Determine the defective status of idler pulleys.
07.14 Troubleshoot idler pulleys.

07.15 Remove and replace idler pulleys or components.
07.16 Determine the defective status of fans.
07.17 Troubleshoot fans.
07.18 Remove and replace fans or components.
07.19 Determine the defective status of rollers/glides.
07.20 Troubleshoot rollers/glides.
07.21 Remove and replace rollers/glides or components.
07.22 Determine the defective status of seals.
07.23 Troubleshoot seals.
07.24 Remove and replace seals or components.
07.25 Determine the defective status of buzzers.
07.26 Troubleshoot buzzers.
07.27 Remove and replace buzzers or components.
07.28 Determine the defective status of clock/timers.
07.29 Troubleshoot clock/timers.
07.30 Remove and replace clock/timers or components.
07.31 Determine the defective status of drive motors.
07.32 Troubleshoot drive motors.
07.33 Remove and replace drive motors or components.
07.34 Determine the defective status of electronic igniters.
07.35 Troubleshoot electronic igniters.
07.36 Remove and replace electronic igniters or components.
07.37 Determine the defective status of self-clean relays.
07.38 Troubleshoot self-clean relays.
07.39 Remove and replace self-clean relays or components.
07.40 Determine the defective status of door switches.
07.41 Troubleshoot door switches.
07.42 Remove and replace door switches or components.
07.43 Determine the defective status of light switches.
07.44 Troubleshoot light switches.
07.45 Remove and replace light switches or components.
07.46 Determine the defective status of motor switches.
07.47 Troubleshoot motor switches.
07.48 Remove and replace motor switches or components.
07.49 Determine the defective status of selector switches.
07.50 Troubleshoot selector switches.
07.51 Remove and replace selector switches or components.
07.52 Determine the defective status of sensors.
07.53 Troubleshoot sensors.
07.54 Remove and replace sensors or components.
07.55 Determine the defective status of filters.
07.56 Troubleshoot filters.
07.57 Remove and replace filters or components.
07.58 Determine the defective status of gas valves oven burners.
07.59 Troubleshoot gas valves oven burners.
07.60 Remove and replace gas valves oven burners or components.
07.61 Determine the defective status of standing pilots.
07.62 Troubleshoot standing pilots.
07.63 Remove and replace standing pilots or components.
07.64 Determine the defective status of pressure regulators.
07.65 Troubleshoot pressure regulators.
07.66 Remove and replace pressure regulators or components.
07.67 Determine the defective status of safety valves.
07.68 Troubleshoot safety valves.
07.69 Remove and replace safety valves or components.
07.70 Determine the defective status of gas valves surface burners.
07.71 Troubleshoot gas valves surface burners.
07.72 Remove and replace gas valves surface burners or components.
07.73 Determine the defective status of thermocouplers.
07.74 Troubleshoot thermocouplers.
07.75 Remove and replace thermocouplers or components.
07.76 Determine the defective status of thermostats.

07.77 Troubleshoot thermostats.
07.78 Remove and replace thermostats or components.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents that may be required when applying for a job.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American

economy.

12.03 List the advantages and disadvantages of business ownership.

12.04 Identify the risks involved in ownership of a business.

12.05 Identify the necessary personal characteristics of a successful entrepreneur.

12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Gasoline Engine Mechanics

CODE NUMBER: Secondary ______ Postsecondary I470606

Florida CIP 0647.060600

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other30,31

CERTIFICATION COVERAGE: GAS ENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as small engine specialist (85328638), small engine mechanics (625.281-034). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic math skills; reading service manuals; use of microfiche and parts catalogs; use of hand tools, power tools and overhaul tools; servicing and reconditioning of engines; and troubleshooting and repairing of governors, speed controls, lubrication, ignition, fuel, power transfer, cooling exhaust and starting systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are consideration integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Laboratory tools and equipment.
03. Demonstrate proficiency in applying customer service skills.
04. Demonstrate proficiency in applying basic mathematics skills.
05. Demonstrate proficiency in repairing and maintaining basic two-stroke cycle engines.
06. Demonstrate proficiency in repairing and maintaining basic four-stroke cycle engines.
07. Diagnose and repair ignition systems.
08. Service fuel systems.
09. Service, repair and adjust engine controls.
10. Repair and service lubrication systems.
11. Service cooling and exhaust systems.
12. Diagnose, service, repair and adjust electrical systems.
13. Service and repair starting systems.
14. Demonstrate proficiency in repairing engine interior components.
15. Demonstrate proficiency in diagnosing and repairing power transfer systems.
16. Demonstrate proficiency in applying technical recording and reporting skills.
17. Demonstrate proficiency in servicing, repairing and adjusting specific types of engines. (elective options)
18. Demonstrate appropriate communication skills.
19. Demonstrate appropriate understanding of basic science.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Gasoline Engine Mechanics POSTSECONDARY NUMBER: I470606

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Practice shop safety rules and procedures.
01.02 Practice personal safety rules and procedures.
01.03 Practice fire safety rules and procedures.
01.04 Practice electrical safety rules nd procedures.
01.05 Practice air tools safety rules and procedures.
01.06 Maintain a clean engine repair shop.

02.0 LABORATORY TOOLS AND EQUIPMENT--The student will be able to:

02.01 Use general hand tools.
02.02 Use special hand tools.
02.03 Use precision measuring tools.
02.04 Use power tools.
02.05 Use fasteners.
02.06 Use gaskets and choose sealants.
02.07 Operate arc welding equipment.
02.08 Operate acetylene torches.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

03.01 Prepare service orders properly.
03.02 Communicate solutions to customers.
03.03 Locate engine models and types.
03.04 Follow manufacturer's service manuals.
03.05 Locate parts in a parts catalog or on microfiche.
03.06 Complete service or work orders including any warranty information required by the manufacturer.
03.07 Listen to and interpret customer complaints to reduce repair time.
03.08 Apply two and four-cycle internal combustion theory or basic turbo-engine theory (as appropriate) to isolate problems.
03.09 Prepare cost estimates.

04.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS--The student will be able to:

04.01 Read and interpret measuring devices (rules and tapes).
04.02 Add 100 addition combinations.
04.03 Add two-digit numbers.
04.04 Add three-digit numbers.
04.05 Subtract 100 subtraction combinations.
04.06 Subtract two-, three- and four-digit numbers.
04.07 Solve one-digit divisor problems.
04.08 Solve two-digit divisor problems.
04.09 Solve two- and three-digit divisor problems.
04.10 Solve multiplication facts
04.11 Multiply by a one-digit factor.
04.12 Multiply by a two-digit factor.
04.13 Identify the parts of a fraction.
04.14 Solve fractional word problems.
04.15 Classify types of fractions.
04.16 Illustrate equivalent fractions.
04.17 Convert fractions.
04.18 Reduce fractions.

04.19 Solve decimal notations.
04.20 Solve number word problems.
04.21 Round to the nearest whole number.
04.22 Add decimals.
04.23 Subtract decimals.
04.24 Multiply decimals.
04.25 Divide a decimal by a decimal.
04.26 Divide a whole number by a decimal.
04.27 Write fractions as decimals and percents.
04.28 Write percents add fractions and decimals.
04.29 Solve percent problems.
04.30 Find the percent of a number.
04.31 Operate a calculator.
04.32 Understand and use the metric system.
04.33 Convert inches to millimeters and millimeters to inches.

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
05.02 Identify types of engines.
05.03 Locate engine serial and model numbers.
05.04 Identify engine assemblies and systems.
05.05 Disassemble engines.
05.06 Remove, clean and inspect the head for cracks, warpage and damaged spark plug threads.
05.07 Remove, clean and inspect piston rods and assemblies.
05.08 Measure out-of-round piston and cylinder.
05.09 Check the total bearing surface of connecting rod bearings.
05.10 Measure piston skirts and ring grooves.
05.11 Measure the piston ring gap in the cylinder bore.
05.12 Install piston pins according to manufacturer's specifications.
05.13 Check rod and piston assembly alignment.
05.14 Install rings on pistons.
05.15 Install piston rod assemblies.
05.16 Check needle bearings
05.17 Inspect crankshafts and install seals.
05.18 Inspect, clean and/or replace reed valves.
05.19 Reassemble engines.
05.20 Diagnose head problems by use of the visual inspection method.
05.21 Diagnose head problems by use of the compression tester method
05.22 Diagnose head problems by use of the cylinder air pressure method.
05.23 Measure and check crankshafts with a micrometer to diagnose engine problems.

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

06.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.
06.02 Identify types of four=stroke cycle engines.
06.03 Locate engine serial and model numbers.
06.04 Identify engine assemblies and systems.
06.05 Disassemble engines.
06.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
06.07 Inspect valves for warpage, burns, cracks, stem wear, tim wear and margin.
06.08 Grind valve seats and reface valves.
06.09 Check and inspect springs for free height, distortion and installed height.

06.10 Adjust valve lash.
06.11 Remove and inspect camshafts and lifters.
06.12 Measure camshafts.
06.13 Service camshaft bearings.
06.14 Clean and inspect lifters for wear.
06.15 Time valve drive assemblies.
06.16 Remove piston from rods assemblies.
06.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
06.18 Check piston pins and bosses for wear.
06.19 Measure piston ring lands width, out-of-round and taper.
06.20 Measure the piston ring gap in the cylinder bore.
06.21 Install and fit piston pins.
06.22 Check rod and piston assembly alignment.
06.23 Remove and replace rod bearings.
06.24 Hone and clean cylinders.
06.25 Install rings on pistons.
06.26 Measure and check crankshafts with a micrometer.
06.27 Check for end play.
06.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
06.29 Reassemble engines.
06.30 Install oil seals.
06.31 Diagnose valve and head problems by use of the visual inspection method, i.e., water contamination vs. fuel-rich or lean carburetor adjustment.
06.32 Diagnose valve and head problems by use of the compression tester method.
06.33 Diagnose valve and head problems by use of the cylinder air pressure method.
06.34 Diagnose valve and head problems by use of the stethoscope method.

07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS--The student will be able to:

07.01 Identify and diagnose ignition systems and components.
07.02 Repair magneto ignition systems.
07.03 Repair solid-state ignition systems.
07.04 Repair battery ignition systems.
07.05 Repair impulse ignition systems.
07.06 Identify spark plugs and special applications.
07.07 Remove, adjust and replace spark plugs.
07.08 Adjust ignition system timing.
07.09 Diagnose magneto ignition systems.
07.10 Diagnose solid-state ignition systems.
07.11 Diagnose battery ignition systems.
07.12 Diagnose impulse ignition systems.

08.0 SERVICE FUEL SYSTEMS--The student will be able to:

08.01 Service air filters.
08.02 Service or replace fuel filters.
08.03 Service and repair suction-type carburetors.
08.04 Service and repair diaphragm-type carburetors.
08.05 Service and repair float-type carburetors.
08.06 Remove and service fuel supply systems.
08.07 Determine and use correct fuel and fuel mixtures.

09.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

09.01 Service, repair and adjust governor speed controls.
09.02 Service, repair and adjust remote speed controls.
09.03 Service, repair and adjust manual start-stop controls.

09.04 Service, repair and adjust electrical start-stop controls.
09.05 Service, repair and adjust zone systems.
09.06 Service, repair and adjust blade clutch controls.
09.07 Service, repair and adjust chain brake systems.
09.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
09.09 Comply with the CPA for interlocks.
09.10 Comply with the CPA for blade tip speed.
09.11 Read and interpret CPA rules and regulations.

10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS--The student will be able to:

10.01 Service crankcase breathers.
10.02 Replace seals and gaskets.
10.03 Identify oil grade terms.
10.04 Identify lubrication systems.
10.05 Identify, understand and relate types and ratios of two-cycle mix oils and their relationship to specific pieces of equipment.
10.06 Select proper oil grades/types.
10.07 Repair and service lubrication systems.

11.0 SERVICE COOLING AND EXHAUST SYSTEMS--The student will be able to:

11.01 Service air cooling fans and screens.
11.02 Service two-cycle exhaust systems.
11.03 Service four-cycle exhaust systems.

12.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

12.01 Operate electrical testing instruments.
12.02 Replace electrical system components.
12.03 Test and service batteries according to manufacturer's requirements and the use of the batter (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours).
12.04 Diagnose electrical system components.
12.05 Service, repair and adjust charging systems.

13.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

13.01 Service and repair manual starting systems.
13.02 Service and repair electrical starting systems.
13.03 Test and service battery starting systems.

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

14.01 Service, repair and adjust valve systems.
14.02 Service, repair and adjust rings, bores and pistons.
14.03 Service, repair and adjust crankshafts and bearings.
14.04 Service, repair and adjust rods.
14.05 Service, repair and adjust lubrication systems.
14.06 Service, repair and adjust internal governor.
14.07 Service, repair and adjust internal components timing.
14.08 Assemble complete engines to manufacturer's specifications.
14.09 Diagnose causes of component failures to determine if they are due to friction, resulting from poor lubrication or contaminated fuel or to normal wear.

15.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

15.01 Inspect and measure belts and chains.
15.02 Install belts and chains.
15.03 Repair manual transmissions.
15.04 Repair differentials.
15.05 Identify power transfer system components.
15.06 Replace drive components.
15.07 Remove and repair clutches.
15.08 Sharpen and balance blades.
15.09 Remove and replace or install blades correctly.
15.10 Remove and replace hydraulic pump systems.
15.11 Diagnose manual transmissions.
15.12 Diagnose differentials.
15.13 Diagnose drive components.

16.0 DEMONSTRATE PROFICIENCY IN APPLYING TECHNICAL RECORDING AND REPORTING SKILLS--The student will be able to:

16.01 Draw and interpret electrical, electronic, hydraulic and mechanical schematics.
16.02 Write reports.
16.03 Maintain test logs.
16.04 Make equipment failure reports.
16.05 Specify and requisition components.
16.06 Compose technical letters.
16.07 Write formal reports of laboratory experiences.

17.0 DEMONSTRATE PROFICIENCY IN SERVICING, REPAIRING AND ADJUSTING SPECIFIC TYPES OF ENGINES (ELECTIVE OPTIONS)--The student will be able to:

17.01 Service, repair and adjust lawn and garden equipment.
17.02 Service, repair and adjust commercial golf course equipment.
17.03 Service, repair and adjust commercial industrial equipment.

18.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

18.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
18.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
18.03 Read and follow written and oral instructions.
18.04 Answer and ask questions coherently and concisely.
18.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
18.06 Demonstrate appropriate telephone/communication skills.

19.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

19.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
19.02 Draw conclusions or make inferences from data.
19.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
19.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

20.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

20.01 Conduct a job search.

20.02 Secure information about a job.
20.03 Identify documents that may be required when applying for a job.
20.04 Complete a job application form correctly.
20.05 Demonstrate competence in job interview techniques.
20.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
20.07 Identify acceptable work habits.
20.08 Demonstrate knowledge of how to make appropriate job changes.
20.09 Demonstrate acceptable employee health habits.
20.10 Demonstrate a knowledge of the Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

21.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

21.01 Define entrepreneurship.
21.02 Describe the importance of entrepreneurship to the American economy.
21.03 List the advantages and disadvantages of business ownership.
21.04 Identify the risks involved in ownership of a business.
21.05 Identify the necessary personal characteristics of a successful entrepreneur.
21.06 Identify the business skills needed to operate a small business efficiently and effectively.

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: General Machining

CODE NUMBER: Secondary 8754000 Postsecondary ______

Florida CIP 0648.052300

SECONDARY SCHOOL CREDITS _6_ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 _x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational _x__ Other _30, 31

CERTIFICATION COVERAGE: MACH SHOP @ 7 G METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as combination machine tool setter/operators (91505735), mill operators (605.685-030), drill press operators (606.682-014), or lathe operators (604.280-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: use of shop math and blueprints to produce machine parts to required size, bench work, precision measurement, and layout.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8754010	General Machining 1
8754020	General Machining 2
8754030	General Machining 3
8754040	General Machining 4
8754050	General Machining 5
8754060	General Machining 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: setup and operation of power saws, lathes, milling machines, drill presses, pedestal grinders and surface grinders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in maintaining immediate work area.
02. Perform mathematical calculations.
03. Demonstrate proficiency in blueprint reading and machine planning.
04. Perform measuring operations.
05. Perform maintenance on machines and tools.
06. Perform bench work skills.
07. Set up and operate power saws.
08. Set up and operate pedestal grinders.
09. Set up and operate drill presses.
10. Set up and operate lathes.
11. Set up and operate milling machines.
12. Set up and operate grinding machines.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER: 8754000
PROGRAM TITLE: General Machining POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN MAINTAINING IMMEDIATE WORK AREA--The student will be able to:

01.01 Dispose of scrap metal chips, shavings, trash and waste.
01.02 Clean and maintain work areas affected by operations.
01.03 Leave area in safe condition.
01.04 Comply with shop safety rules and practices.
01.05 Comply with shop operating rules and practices.
01.06 Participate in "clean up" of work and shop areas.
01.07 Maintain a clean and orderly shop.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate an understanding of the proper handling of hazardous waste and chemicals.

02.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

02.01 Make job-related decimal and fraction calculations.
02.02 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
02.03 Solve job-related problems using a hand-held calculator.
02.04 Solve job-related problems using basic formulas.
02.05 Solve job-related problems using basic geometry.
02.06 Measure a workpiece and compare measurements with blueprint specifications.
02.07 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
02.08 Solve job-related problems using mathematical handbooks, charts, and tables.
02.09 Convert measurements from English to metric and from metric to English units.
02.10 Determine the clearance, relief and rake of cutting tools.
02.11 Calculate machine speeds and feeds using appropriate formulas.

03.0 DEMONSTRATE PROFICIENCY IN BLUEPRINT READING AND MACHINE PLANNING--The student will be able to:

03.01 Interpret view concepts.
03.02 Read lines.
03.03 Read and interpret title blocks.
03.04 Read and interpret change orders on working and assembly prints.
03.05 Read and interpret abbreviations.
03.06 Make shop sketches.
03.07 Read and interpret blueprints, including those with geometric tolerancing.
03.08 Determine and interpret reference information used in performing machine work.
03.09 Perform layout for precision machine work by using layout instruments.
03.10 Lay out radial and bolt hole circles.
03.11 Inspect, remove and replace manufactured parts that need repair or machine work.
03.12 Select the most productive tool and tooling for a given operation.
03.13 Define methods and importance of quality control.
03.14 Understand methods used for determining total cost involved in product production.

04.0 PERFORM MEASURE OPERATIONS--The student will be able to:

04.01 Read and measure with rules and calipers.
04.02 Read and measure with micrometers.
04.03 Read and measure with vernier tools.
04.04 Read and measure with dial indicators.
04.05 Measure with surface plates.

05.0 PERFORM MAINTENANCE ON MACHINES AND TOOLS--The student will be able to:

05.01 Lubricate equipment parts.
05.02 Clean and store hand tools, cutters, fixtures, jigs and attachments.
05.03 Inspect and repair hand tools.
05.04 Inspect drive pulleys or belts.
05.05 Select lubricants for machining operations.
05.06 Inspect equipment for safe operational conditions.
05.07 Store grinding wheels.
05.08 Store precision tools.
05.09 Inspect and adjust machine guards.
05.10 Inspect work areas to assure a safe working environment.

06.0 PERFORM BENCH WORK SKILLS--The student will be able to:

06.01 Cut materials by using hand hacksaws.
06.02 Cut threads by using hand taps.
06.03 Cut threads by using dies.
06.04 Ream holes by using hand reamers.
06.05 Hand-sharpen cutting tools by using abrasive stones.
06.06 Hone and lap surfaces.
06.07 Remove damaged screws and other hardware.
06.08 Set up and use arbor press broaches.
06.09 Deburr workpieces.

07.0 SET UP AND OPERATE POWER SAWS--The student will be able to:

07.01 Remove and replace saw blades.
07.02 Select appropriate blades to perform given sawing operations.
07.03 Select and set speeds and feeds for given sawing operations.
07.04 Measure and cut off material using a power saw.
07.05 Saw to scribed lines by using a metal band saw.
07.06 Cut and weld band saw blades to insert for contour sawing.
07.07 Set up and operate saws for angular cutting.

08.0 SET UP AND OPERATE PEDESTAL GRINDERS--The student will be able to:

08.01 Comply with safe and efficient work practices.
08.02 Identify the parts of the machine and explain their use.
08.03 Set up support rests.
08.04 Dress grinding wheels.
08.05 Grind lathe tools to required angles.
08.06 Sharpen drills.

09.0 SET UP AND OPERATE DRILL PRESSES--The student will be able to:

09.01 Identify the parts of the machine and explain their use.
09.02 Identify and set the machine controls.
09.03 Comply with safe and efficient work practices.
09.04 Select the proper tooling.
09.05 Set up for and perform hole work, center drill, drill, ream, countersink, counterbore and power tapping.
09.06 Set drill presses for proper feeds and speeds for specified

operations.

10.0 SET UP AND OPERATE LATHES--The student will be able to:

10.01 Identify the parts of the machine and explain their use.
10.02 Comply with general safe and efficient work practices.
10.03 Measure stock.
10.04 Set up an engine lathe.
10.05 Secure tools, tool holders and fixtures or attachments.
10.06 Select and set feeds and speeds.
10.07 Set up lathes and face workpieces held in chucks.
10.08 Rough-cut and finish-cut with lathes.
10.09 Perform lathe filing to deburr parts.
10.10 Align lathe centers using accurate methods.
10.11 Drill holes with lathes.
10.12 Countersink holes with lathes.
10.13 Ream holes with lathes.
10.14 Tap threads with lathes.
10.15 Die cut threads with lathes.
10.16 Counterbore holes with lathes.
10.17 Bore holes with lathes.
10.18 Knurl parts with lathes.
10.19 Cut external threads with lathes.
10.20 Rechase threads with lathes.
10.21 Cut internal threads with lathes.
10.22 Set up and perform taper turning with taper attachments.
10.23 Set up and perform taper turning with the compound.
10.24 Cut internal tapered surfaces.
10.25 Set up and operate tool post grinders.
10.26 Perform contour, angular or radial cuts with lathes.
10.27 Set up and use follow- and steady rests.
10.28 Set up face plates and dogs.

11.0 SET UP AND OPERATE MILLING MACHINES--The student will be able to:

11.01 Identify the parts of the horizontal and vertical machine and explain their use.
11.02 Comply with safe and efficient work practices.
11.03 True up the head and align milling machine fixtures.
11.04 Select and set feeds and speeds for milling work.
11.05 Square up workpieces with a table vise.
11.06 Perform end milling.
11.07 Perform fly cutting operations.
11.08 Drill holes with milling machines.
11.09 Perform reaming operations.
11.10 Cut external keyways.
11.11 Bore holes with milling machines.
11.12 Perform form milling.
11.13 Perform indexing operations using a dividing head.
11.14 Set up and operate rotary tables.
11.15 Mill cylindrical work.
11.16 Mill an external radius.
11.17 Mill an angle.
11.18 Align milling machine attachments.
11.19 Mill internal slots with a slotter and attachment.
11.20 Perform cutting-off operations.
11.21 Set up and perform slab mill operations.
11.22 Use an edge finder and wiggler.
11.23 Use digital readouts.

12.0 SET UP AND OPERATE GRINDING MACHINES--The student will be able to:

12.01 Identify the parts of the machine and explain their uses.
12.02 Comply with safe and efficient work practices.
12.03 Select the proper wheel.
12.04 Inspect, balance, dress and true grinding wheels.
12.05 Attach and align workpieces for grinding operations.
12.06 Set up and grind parallel flat surfaces.
12.07 Set up and grind four sides square.
12.08 Set up and use angle plates.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

3.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: General Machining PROGRAM NUMBER: 8754000

COURSE TITLE: General Machining 1 COURSE NUMBER: 8754010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing prerequisite machining skills.

01.0 DEMONSTRATE PROFICIENCY IN MAINTAINING IMMEDIATE WORK AREA--The student will be able to:

01.01 Dispose of scrap metal chips, shavings, trash and waste.
01.02 Clean and maintain work areas affected by operations.
01.03 Leave area in safe condition.
01.04 Comply with shop safety rules and practices.
01.05 Comply with shop operating rules and practices.
01.06 Participate in "clean up" of work and shop areas.
01.07 Maintain a clean and orderly shop.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate an understanding of the proper handling of hazardous waste and chemicals.

02.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

02.01 Make job-related decimal and fraction calculations.
02.02 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
02.03 Solve job-related problems using a hand-held calculator.
02.04 Solve job-related problems using basic formulas.
02.05 Solve job-related problems using basic geometry.
02.06 Measure a workpiece and compare measurements with blueprint specifications.
02.07 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
02.08 Solve job-related problems using mathematical handbooks, charts, and tables.
02.09 Convert measurements from English to metric and from metric to English units.
02.10 Determine the clearance, relief and rake of cutting tools.
02.11 Calculate machine speeds and feeds using appropriate formulas.

03.0 DEMONSTRATE PROFICIENCY IN BLUEPRINT READING AND MACHINE PLANNING--The student will be able to:

3.01 Interpret view concepts.
03.02 Read lines.
03.03 Read and interpret title blocks.
03.04 Read and interpret change orders on working and assembly prints.
03.05 Read and interpret abbreviations.
03.06 Make shop sketches.
03.07 Read and interpret blueprints, including those with geometric tolerancing.
03.08 Determine and interpret reference information used in performing machine work.
03.09 Perform layout for precision machine work by using layout instruments.

03.10 Lay out radial and bolt hole circles.
03.11 Inspect, remove and replace manufactured parts that need repair or machine work.
03.12 Select the most productive tool and tooling for a given operation.
03.13 Define methods and importance of quality control.
03.14 Understand methods used for determining total cost involved in product production.

04.0 PERFORM MEASURING OPERATIONS--The student will be able to:

04.01 Read and measure with rules and calipers.
04.02 Read and measure with micrometers.
04.03 Read and measure with vernier tools.
04.04 Read and measure with dial indicators.
04.05 Measure with surface plates.

05.0 PERFORM MAINTENANCE ON MACHINES AND TOOLS--The student will be able to:

05.01 Lubricate equipment parts.
05.02 Clean and store hand tools, cutters, fixtures, jigs and attachments.
05.03 Inspect and repair hand tools.
05.04 Inspect drive pulleys or belts.
05.05 Select lubricants for machining operations.
05.06 Inspect equipment for safe operational conditions.
05.07 Store grinding wheels.
05.08 Store precision tools.
05.09 Inspect and adjust machine guards.
05.10 Inspect work areas to assure a safe working environment.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

3.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: General Machining PROGRAM NUMBER: 8754000
COURSE TITLE: General Machining 2 COURSE NUMBER: 8754020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing bench work skills and in setting up and operating power saws.

06.0 PERFORM BENCH WORK SKILLS--The student will be able to:

06.01 Cut materials by using hand hacksaws.
06.02 Cut threads by using hand taps.
06.03 Cut threads by using dies.
06.04 Ream holes by using hand reamers.
06.05 Hand-sharpen cutting tools by using abrasive stones.
06.06 Hone and lap surfaces.
06.07 Remove damaged screws and other hardware.
06.08 Set up and use arbor press broaches.
06.09 Deburr workpieces.

07.0 SET UP AND OPERATE POWER SAWS--The student will be able to:

07.01 Remove and replace saw blades.
07.02 Select appropriate blades to perform given sawing operations.
07.03 Select and set speeds and feeds for given sawing operations.
07.04 Measure and cut off material using a power saw.
07.05 Saw to scribed lines by using a metal band saw.
07.06 Cut and weld band saw blades to insert for contour sawing.
07.07 Set up and operate saws for angular cutting.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: General Machining PROGRAM NUMBER: 8754000
COURSE TITLE: General Machining 3 COURSE NUMBER: 8754030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating pedestal grinders and drill presses.

08.0 SET UP AND OPERATE PEDESTAL GRINDERS--The student will be able to:

08.01 Comply with safe and efficient work practices.
08.02 Identify the parts of the machine and explain their use.
08.03 Set up support rests.
08.04 Dress grinding wheels.
08.05 Grind lathe tools to required angles.
08.06 Sharpen drills.

09.0 SET UP AND OPERATE DRILL PRESSES--The student will be able to:

09.01 Identify the parts of the machine and explain their use.
09.02 Identify and set the machine controls.
09.03 Comply with safe and efficient work practices.
09.04 Select the proper tooling.
09.05 Set up for and perform hole work, center drill, drill, ream, countersink, counterbore and power tapping.
09.06 Set drill presses for proper feeds and speeds for specified operations.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: General Machining

PROGRAM NUMBER: 8754000

COURSE TITLE: General Machining 4

COURSE NUMBER: 8754040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating lathes.

10.0 SET UP AND OPERATE LATHES--The student will be able to:

10.01 Identify the parts of the machine and explain their use.
10.02 Comply with general safe and efficient work practices.
10.03 Measure stock.
10.04 Set up an engine lathe.
10.05 Secure tools, tool holders and fixtures or attachments.
10.06 Select and set feeds and speeds.
10.07 Set up lathes and face workpieces held in chucks.
10.08 Rough-cut and finish-cut with lathes.
10.09 Perform lathe filing to deburr parts.
10.10 Align lathe centers using accurate methods.
10.11 Drill holes with lathes.
10.12 Countersink holes with lathes.
10.13 Ream holes with lathes.
10.14 Tap threads with lathes.
10.15 Die cut threads with lathes.
10.16 Counterbore holes with lathes.
10.17 Bore holes with lathes.
10.18 Knurl parts with lathes.
10.19 Cut external threads with lathes.
10.20 Rechase threads with lathes.
10.21 Cut internal threads with lathes.
10.22 Set up and perform taper turning with taper attachments.
10.23 Set up and perform taper turning with the compound.
10.24 Cut internal tapered surfaces.
10.25 Set up and operate tool post grinders.
10.26 Perform contour, angular or radial cuts with lathes.
10.27 Set up and use follow- and steady rests.
10.28 Set up face plates and dogs.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: General Machining

PROGRAM NUMBER: 8754000

COURSE TITLE: General Machining 5

COURSE NUMBER: 8754050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating milling machines.

11.0 SET UP AND OPERATE MILLING MACHINES--The student will be able to:

11.01 Identify the parts of the horizontal and vertical machine and explain their use.
11.02 Comply with safe and efficient work practices.
11.03 True up the head and align milling machine fixtures.
11.04 Select and set feeds and speeds for milling work.
11.05 Square up workpieces with a table vise.
11.06 Perform end milling.
11.07 Perform fly cutting operations.
11.08 Drill holes with milling machines.
11.09 Perform reaming operations.
11.10 Cut external keyways.
11.11 Bore holes with milling machines.
11.12 Perform form milling.
11.13 Perform indexing operations using a dividing head.
11.14 Set up and operate rotary tables.
11.15 Mill cylindrical work.
11.16 Mill an external radius.
11.17 Mill an angle.
11.18 Align milling machine attachments.
11.19 Mill internal slots with a slotter and attachment.
11.20 Perform cutting-off operations.
11.21 Set up and perform slab mill operations.
11.22 Use an edge finder and wiggler.
11.23 Use digital readouts.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: General Machining

PROGRAM NUMBER: 8754000

COURSE TITLE: General Machining 6

COURSE NUMBER: 8754060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating grinding machines and demonstrating employability skills and an understanding of entrepreneurship.

12.0 SET UP AND OPERATE GRINDING MACHINES--The student will be able to:

12.01 Identify the parts of the machine and explain their uses.
2.02 Comply with safe and efficient work practices.

12.03 Select the proper wheel.
12.04 Inspect, balance, dress and true grinding wheels.
12.05 Attach and align workpieces for grinding operations.
12.06 Set up and grind parallel flat surfaces.
12.07 Set up and grind four sides square.
12.08 Set up and use angle plates.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Glazing

CODE NUMBER: Secondary ______ Postsecondary I460406

Florida CIP 0646.040600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G GLAZIER @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a glazier (87811550), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and installation and repair of all types of glass, plastic, and acrylic windows, walls, and panels.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safe use of tools, equipment and materials, cutting and installation of glass, acrylics and plastics, and installation of doors, windows and hardware.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform mathematical calculations and estimate quantities of materials.
02. Read and interpret blueprints.
03. Cut and install glass, acrylics and plastics.
04. Identify, select and use glazing and caulking compounds.
05. Install doors, windows and hardware.
06. Replace broken or defective panels.
07. Demonstrate appropriate communication skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Glazing POSTSECONDARY NUMBER: I460406

01.0 PERFORM MATHEMATICAL CALCULATIONS AND ESTIMATE QUANTITIES OF MATERIALS--The student will be able to:

01.01 Measure frames with ruler to determine size of panes needed.
01.02 Use measurement instruments and tools to determine dimensions.
01.03 Develop material utilization and cost estimate for jobs.

02.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

02.01 Differentiate between various types of glass.
02.02 Identify parts of a building component using a blueprint.
02.03 Recognize commonly used symbols on blueprints and schematics.
02.04 Interpret blueprints and schematics.
02.05 Perform job set up.
02.06 Lay out cutting lines on glass following specifications, and cut glass to shape.
02.07 Mark outline or pattern on glass.

03.0 CUT AND INSTALL GLASS, ACRYLICS AND PLASTICS--The student will be able to:

03.01 Store, handle and transport glass and materials safely.
03.02 Polish glass.
03.03 Tint glass.
03.04 Spray glass with tinting solution.
03.05 Coat glass.
03.06 Cut and install laminated safety glass in windows and windshields.
03.07 Install mirrors or structural glass using mastic, screws, or decorating molding.
03.08 Install glass in windows, skylights, store fronts, display cases, or on surfaces.
03.09 Apply edging to glass.
03.10 Grind and bevel edges of glass.
03.11 Scribe and cut glass with straight edge of glass cutter to specifications.
03.12 Break off excess glass by hand and notched tool.
03.13 Cut glass to fit window dimension.
03.14 Cut glass following pattern, using glasscutters.
03.15 Select and use proper tools and equipment for job.

04.0 IDENTIFY, SELECT AND USE GLAZING AND CAULKING COMPOUNDS--The student will be able to:

04.01 Install solar heat collector glass units.
04.02 Install glass and insert glazing points and wire clips using putty knife or spring machine.
04.03 Prepare putty for wood sash use.
04.04 Select proper type of materials.
04.05 Prepare putty for steel sash use.
04.06 Apply sealants and gasket materials as prescribed by manufacturers.
04.07 Spread and smooth putty around edges of panes with putty knife to seal joints.

05.0 INSTALL DOORS, WINDOWS AND HARDWARE--The student will be able to:

05.01 Install or replace screen and hardware wire.
05.02 Replace screen or metal screen frame.
05.03 Replace screen on wood screen frame.
05.04 Install or replace a window and casing in accordance with manufacturers specifications.
05.05 Select, measure, and cut metal or plastic moldings and members to required length in accordance with manufacturers specifications.
05.06 Install or replace a prehung door and casing in accordance with manufacturers specifications.
05.07 Install or replace door and/or window hardware in accordance with manufacturers specifications.
05.08 Drill holes in glass and mirrors.
05.09 Install airtight plate glass windows in refrigeration display cases and walk in coolers.
05.10 Install glass in doors or other openings in metal furniture using handtools and power tools.
05.11 Secure glass by fastening metal and insulating strips around edges in accordance with manufacturers specifications.
05.12 Assemble and install metal framed glass enclosures for showers.
05.13 Install or replace stained glass windows in accordance with manufacturers specifications.
05.14 Install or replace metal window and door frames into which glass panels are to be fitted in accordance with manufacturers specifications.
05.15 Set glass doors into frame and fit hinges in accordance with manufacturers specifications.
05.16 Fasten hardware to glass doors in accordance with manufacturers specifications.
05.17 Fasten glass panes into wood sash with glaziers points.
05.18 Assemble platform and staging materials for high work.
05.19 Fasten and use safety lines and equipment.
05.20 Attach and use respirator when working with toxic materials.
05.21 Comply with safety regulations and procedures.

06.0 REPLACE BROKEN OR DEFECTIVE PANELS--The student will be able to:

06.01 Inspect glass for flaws, chips, scratches, or rough spots.
06.02 Remove old putty.
06.03 Remove broken glass with chisel, hacking knife or power tools.
06.04 Remove and replace glass in metal frame window.
06.05 Remove and replace glass in wood frame window.
06.06 Install or replace tempered plastic.
06.07 Install or replace thermopane.
06.08 Remove and replace old or damaged glass.
06.09 Remove hardware and glass retainers.
06.10 Install or replace plate, safety, or wire glass.

07.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

07.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
07.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
07.03 Read and follow written and oral instructions.
07.04 Answer and ask questions coherently and concisely.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
07.06 Demonstrate appropriate telephone/communication skills.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student

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will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Graphic Arts Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0650.040201

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS_x_ POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

_x_Postsecondary Vocational ___Other__________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a printing operations manager, this program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: administration; pre-press; press and post-press operations, copy preparation, stripping black and white, line graphic photo processes, offset presswork, estimating, graphic arts halftone processes and color reproduction technology.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: customer layouts, composition and camera ready copy; producing line negatives, halftone negatives and contacts; stripping line negatives, halftone negatives, and multicolor and process color; producing printing plates, single color proofs and color proofs; operating and adjusting duplicators; and operating cutting, folding and binding equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral pat of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform reproduction process operations.
02. Perform estimating operations.
03. Perform graphic design operations.
04. Perform typographical operations.
05. Perform copy preparation operations.
06. Perform line graphic photo operations.
07. Perform graphic arts halftone operations.
08. Perform color reproduction operations.
09. Perform stripping operations.
10. Perform proofing and plate-making operations.
11. Perform offset operations.
12. Perform finishing operations.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER: ______
PROGRAM TITLE: Graphic Arts Technology POSTSECONDARY NUMBER:

01.0 PERFORM REPRODUCTION PROCESS OPERATIONS--The student will be able to:

01.01 Identify the equipment and materials used in reproduction process operations, their parts and functions and the safety rules relating to their operation.
01.02 Set up and operate reproduction tools and equipment.
01.03 Perform operator maintenance on reproduction equipment.
01.04 Identify and explain the scope, purpose, size and products of the graphic communications industry by identifying various statistics that relate to its existence.
01.05 Trace the evolution of writing, kinds of communications, materials used and printing by identifying and recalling times, cultures and specific inventions.
01.06 Analyze the various reproduction processing such as: letterpress, gravure, offset lithography, screen, flexography and electronic.
01.07 Compare and contrast the various reproduction of elements in each reproduction process to distinguish the strengths and weaknesses of each.
01.08 Explain the value of planning and design to the graphic communication process by identifying principles of design and the steps used in the planning of layouts.
01.09 Analyze the various printing surfaces by contrast and comparison to a variety of elements in each process to distinguish the difference in each surface.
01.10 Evaluate printing processes by judging advantages and disadvantages of each.
01.11 Define terms used in mark-up of copy for composition by being able to recognize marks, instructions and other data.
01.12 Place in sequential order the production steps of a printing job from conception to completion.
01.13 Define terms used in making a paste-up or mechanical.
01.14 Define and explain the elements of typography and their value to the printing and design process.
01.15 Analyze typographic terms.
01.16 Analyze the current systems of composition by comparison and contrast and by being able to categorize and distinguish each.
01.17 Define and explain the terms and methodology used in commercial and process photography as they relate to the printing processes.
01.18 Analyze plates used in the various printing processes.
01.19 Define and explain the principles and generalizations in the use of color in design of printing.
01.20 Define and explain the history of inks, substrates and differences between printing processes.
01.21 Define and explain the history of paper and basic components in paper by recalling items used in place of paper and identifying the steps used in the manufacture of paper.
01.22 List and explain career opportunities in printing.
01.23 Analyze the difference between artist use and production use of printing.
01.24 Set up and operate machine used in reproduction process operation in accordance with manufacturer's specifications.
01.25 Perform operator maintenance on machine used in reproduction process operation in accordance with manufacturer's specifications.

02.0 PERFORMING ESTIMATING OPERATIONS--The student will be able to:

02.01 Identify the equipment and materials used in estimating operations, their parts and functions and the safety rules relating to their operation.
02.02 Define and explain the methods of reproduction illustrated by offset and letter press.
02.03 Define and explain the organization and management of a wall organized printing company by identifying its organizational elements.
02.04 Define and explain an estimator's duties including the knowledge of categories of production pertaining to estimating.
02.05 Define and explain the role and responsibility of the estimator in a printing plant.
02.06 Define and explain the sources of information available to the estimator.
02.07 Define and explain the factors that must be considered by the estimator in preparing an estimate such as standard production times, budgeted hour cost rates, outside purchased services and material costs.
02.08 Analyze terms used in estimating.
02.09 Place in sequential order the progressive steps for preparing an estimate.
02.10 Define and explain the principle characteristics of the different papers used in the printing process.
02.11 List the job tasks that usually appear on an estimating form.
02.12 List the job tasks that usually appear on an estimating form in the sequential order in which they are usually performed.
02.13 Apply formula for computing weight of paper stock.
02.14 Define and explain basic sheet sizes by listing the paper categories with the basic sheet size for each.
02.15 Prepare costs estimates utilizing given items, costs and specifications for a one-color, one-up job.
02.16 Prepare costs estimates utilizing given items, costs and specifications for a one-color, multiple.
02.17 Prepare cost estimates utilizing given items, costs and specifications for a one-color, step job.
02.18 Prepare cost estimates utilizing given items, costs and specifications for a one-color, four-page job.
02.19 Prepare cost estimates utilizing given items, costs and specifications for a one-color, eight-page job.
02.20 Prepare cost estimates utilizing given items, costs and specifications for a one color, sixteen-page folded, saddle stitched job.

03.0 PERFORM GRAPHIC DESIGN OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in graphic design operations, their parts and functions and the safety rules relating to their operation.
03.02 Set up and operate graphic design operation tools and equipment.
03.03 Perform operator maintenance on graphic design operation equipment.
03.04 Prepare thumbnail layout.
03.05 Prepare rough layout.
03.06 Prepare comprehensive layout including finish working dummy.
03.07 Size and proportion photographs, line drawings and other copy elements.
03.08 Copyfit and mark up (specify type sizes and styles).

04.0 PERFORM TYPOGRAPHICAL OPERATIONS--The student will be able to:

04.01 Identify the equipment and materials used in typographical operations, their parts and functions and the safety rules relating to their operation.
04.02 Set up and operate typographical tools and equipment.
04.03 Perform operator maintenance on typographical equipment.
04.04 Define and explain typographic terms for measurement.
04.05 Set up and proofread type by a variety of means.
04.06 Analyze and solve printing measurement problems using a group of specific facts, a system of logic and arithmetic based on printer's measurements.
04.07 Set up and operate a variety of typesetting machines.
04.08 Evaluate printed typed samples for visual spacing to mechanical spacing and certain letter combinations to other letter combinations and produce examples.
04.09 Define terms used in typesetting and typography and explain the difference.
04.10 Define and explain terms that deal with type identification.
04.11 Define and explain the elements of typography and their values in printing and design.
04.12 Solve copyfitting problems by applying typographic principles.
04.13 Evaluate typesetting systems by judging their advantages and their disadvantages.
04.14 Apply the principles of several copyfitting systems for counting manuscripts by predicting keystrokes in each system.
04.15 Perform manual, automatic and semi-automatic justification decisions.

05.0 PERFORM COPY PREPARATION OPERATIONS--The student will be able to:

05.01 Identify the equipment and materials used in copy preparation operations, their parts and functions and the safety rules relating to their operation.
05.02 Set up and operate copy preparation tools and equipment.
05.03 Perform operator maintenance on copy preparation equipment.
05.04 Define and explain the scope and purpose of copy preparation.
05.05 Define and explain terms used in copy preparation.
05.06 Define and explain career opportunities preparation.
05.07 Apply the principles of mechanical paste-up using printed type proofs.
05.08 Define, explain and demonstrate how to scale by diagonal line method.
05.09 Define, explain and demonstrate the use of the proportion wheel.
05.10 Apply the use of the proportion wheel to various copy situations.
05.11 Define, explain and demonstrate layout for mechanicals.
05.12 Define and explain the different types of light sensitive materials used on copy preparation.
05.13 Define, explain and apply the elements of mechanical masking.
05.14 Explain and demonstrate the use of a process color chart such as a Murphy color wheel when specifying color breaks.
05.15 Demonstrate the use of amberlith by cutting to the specific areas where color is to be masked in basic art drawings.
05.16 Demonstrate application of room light film materials.
05.17 Paste up mechanical elements including keyline for photographs and tint blocks; and ruling.
05.18 Prepare tissue overlay and specify color break, tint percentages, and reverses.
05.19 Check and compare completed mechanical to comprehensive layout for final proofing.

06.0 PERFORM LINE GRAPHIC PHOTO OPERATIONS--The student will be able to:

06.01 Identify the equipment and materials used in line graphic photo operations, their parts and functions and the safety rules relating to their operations.

06.02 Set up and operate line graphic photo tools and equipment.

06.03 Perform operator maintenance on line graphic photo equipment.

06.04 Analyze and solve lithographic scaling problems by analyzing facts, calculating proper sizes or percentages and stating solutions in appropriate terms.

06.05 Define and explain the photographic record.

06.06 Define and explain terms relating to film construction.

06.07 Define and explain characteristics of film relating to speed, contrast and color.

06.08 Define and explain terms relating to line photography.

06.09 Define and explain terms relating to electromagnetic energy and spectrum.

06.10 Demonstrate the application and alignment of camera planes and working parts.

06.11 Operate a process camera by making various adjustments and by making a series of negatives to produce appropriate results using a variety of photographic materials.

06.12 Demonstrate the application and limitation of the relationship between time, f-stop, exposure and light intensity by using a reflection density guide and interpreting results.

06.13 Define and explain specific terms in relation to a process camera lens.

06.14 Define and explain lens aberrations and flare.

06.15 Define and explain the law of inverse squares, law of reflection, and law of reflection of light.

06.16 Demonstrate application and limitation of the relationship between bellows extension, exposure and f-stops by using formulas, charts, diaphragm control systems and interpret results.

06.17 Demonstrate the mixing of photographic chemicals for processing of photographic materials by identifying rations, recognizing terms and different chemical and mixing them when necessary.

06.18 Operate a vacuum frame and use a variety of films, copy and procedures.

06.19 Demonstrate application and procedures to produce film negatives and positives with a variety of films, equipment and conditions.

06.20 Demonstrate the use of a reflection density guide by establishing a standard under a given set of conditions for prediction, control and standardization of results.

06.21 Demonstrate the use of a density guide and the arithmetic behind it by identifying step relationships, explaining exposure changes to steps, by being able to explain changes in density and by confirming them in laboratory practice.

06.22 Define and explain terms relating to photographic filters used in process photography.

06.23 Demonstrate the use of filters in laboratory projects.

06.24 Define and explain the need and value of establishing and maintaining standardized procedures.

07.0 PERFORM GRAPHIC ARTS HALFTONE OPERATIONS--The student will be able to:

07.01 Identify the equipment and materials used in graphic arts halftone operations, their parts and functions and the safety rules relating to their operation.

07.02 Set up and operate graphic arts halftone tools and equipment.

07.03 Perform operator maintenance on graphic arts halftone equipment.

07.04 Define halftone terminology.

07.05 Calibrate a reflection densitometer to manufacturer's specifications.

07.06 Compare and contrast the funding of the reflection densitometer with the Kodak Density Guide.

07.07 Solve a variety of exposure problems using an exposure computer.
07.08 Solve a variety of exposure problems using neutral density filters.
07.09 Demonstrate and explain a variety of special films such as litho pan, rapid access and room light.
07.10 Evaluate a typical printed halftone under normal laboratory conditions and determine the best possible exposure combination to help establish laboratory standards halftone photography.
07.11 Develop sets of directions for the major basics of halftone photography, basic exposure, basic density range of the contact screen, basic density of the copy, basic flash and basic material on which to print on.
07.12 Solve a variety of problems by applying the principles of densitometry and exposure.

08.0 PERFORM COLOR REPRODUCTION OPERATIONS--The student will be able to:

08.01 Identify the equipment and materials used in color reproduction operations, their parts and functions and the safety rules relating to their operation.
08.02 Set up and operate color reproduction tools and equipment.
08.03 Perform operator maintenance on color reproduction equipment.
08.04 Apply the principles of visible light by constructing a spectrograph and placing the major subdivisions of white light in their proper position according to scientific theory.
08.05 Define and explain the interrelationship of light and color.
08.06 Define and explain the principles of color theory as they apply to process printing.
08.07 Define and explain the difference between additive and subtractive color.
08.08 Define and explain the color absorption/reflection theory as it applies to process color filters and printing inks.
08.09 Compare and contrast color separation systems for direct, indirect and electronic scanning.
08.10 Interpret manufacturer's film data sheets of various applicable films.
08.11 Define and explain densitometry and sensitometry.
08.12 Apply the principles of densitometry and sensitometry to establish local laboratory standards.
08.13 Define and explain the requirements for photographic color separation by listing the materials, equipment, facilities and special considerations required in the process.
08.14 Define and explain the requirements for color production by graphing and interpreting the deficiencies of printing inks.

09.0 PERFORM STRIPPING OPERATIONS--The student will be able to:

09.01 Identify the equipment and materials used in stripping operations, their parts and functions and the safety rules relating to their operation.
09.02 Set up and operate stripping operations tools and equipment.
09.03 Perform operator maintenance on stripping operations equipment.
09.04 Define and explain terms used in stripping.
09.05 Define and explain stripping as a career opportunity.
09.06 Analyze the various approaches to stripping by comparing and contrasting pre-printed masking sheets with conventional non-printed masking sheets.
09.07 Identify the parts of a contact frame and point light source and explain their use.
09.08 Produce contacts using orthochromatic and duplicating film using transmission density guide and standard time and temperature development.

09.09 Identify equipment and materials used in the stripping function and the safety rules pertaining to each.
09.10 Apply basic principles of stripping using: T-square and triangle to align, position and tape film.
09.11 Prepare working dummy and produce a one-color, one-up layout.
09.12 Prepare working dummy and produce a one-color, multiple layout.
09.13 Define and explain methodology relating to step-and-repeat by choosing or recognizing the different procedures relating to particular situations.
09.14 Prepare working dummy and produce a one-color, step layout.
09.15 Prepare working dummy and produce a one-color, four-page layout.
09.16 Prepare working dummy and produce a one-color, eight-page layout.
09.17 Demonstrate the cutting of rubylith masks by trapping to key line negatives.
09.18 Prepare a working dummy and apply principles of a pin-register system to produce a multiple-burn exposure layout (halftone and screen tints).
09.19 Prepare a working dummy and apply principles of a pin-register system to produce and strip a multi-flat color layout.
09.20 Produce composed film from multi-flat color layout and strip in position.
09.21 Inspect and evaluate flats to original mechanical.

10.0 PERFORM PROOFING & PLATEMAKING OPERATIONS--The student will be able to:

10.01 Identify the equipment and materials used in proofing and platemaking operations, their parts and functions and the safety rules relating to their operation.
10.02 Set up and operate proofing and platemaking tools and equipment.
10.03 Perform operator maintenance on proofing and platemaking equipment.
10.04 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide.
10.05 Produce proofs on diazo, silver and color proofing materials.
10.06 Inspect and evaluate proofs to original mechanical.
10.07 Identify, contrast and compare image carriers such as paper, photo direct, foil, aluminum additive and aluminum subtractive for run length and quality to suit customer specifications.
10.08 Process paper, photo direct, foil, aluminum additive and aluminum subtractive image carriers to manufacturer specifications.
10.09 Inspect and evaluate plates to proofs.
10.10 File, handle and retrieve flats and plates.

11.0 PERFORM OFFSET OPERATIONS--The student will be able to:

11.01 Identify the equipment and materials used in offset presswork operations, their parts and functions and the safety rules, rules relating to their operation.
11.02 Set up and operate offset presswork tools and equipment.
11.03 Perform operator maintenance on offset presswork equipment.
11.04 Define and explain the basic principle of the lithographic process.
11.05 Compare and contrast a single-sheet feeder, stream-fed, web-fed systems.
11.06 Compare and contrast deliver systems for sheet- and web-fed systems.
11.07 Compare and contrast register systems such as side-guide, pull-guide and head register.
11.08 Compare and contrast ink and moisture system for sheet- and web-fed systems.
11.09 Explain make ready procedures in proper sequence in preparation for actual production.

11.10 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous).
11.11 Apply basic principles of offset lithography pertaining to fountain solutions chemical components (acid, alkaline and neutral).
11.12 Apply basic principles of offset lithography pertaining to pH control and its effects on the lithographic process.
11.13 Apply basic principles of offset lithography pertaining to interrelationships of paper.
11.14 Demonstrate the inking system by identifying each part and making proper adjustments.
11.15 Make ready and demonstrate feeder and delivery systems.
11.16 Demonstrate methods for achieving register by making machine adjustments.
11.17 Apply basic principles of offset press operations to produce work and turn, work and tumble and sheetwise printed products.

12.0 PERFORM FINISHING OPERATIONS--The student will be able to:

12.01 Identify the equipment and materials used in finishing/binding operation, their parts and functions and the safety rules relating to their operation.
12.02 Identify basic principles of finishing/binding operations pertaining to pre-press paper cutting, post press paper cutting and post bindery cutting (after folding, stitching, etc.).
12.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting.
12.04 Identify basic principles of finishing/binding operations pertaining to grain, caliper and finish (coated or uncoated or paper).
12.05 Identify basic principles of finishing/binding operations pertaining to signature configurations for sheet and web presses.
12.06 Apply basic principles of finishing/binding operations pertaining to folding.
12.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating.
12.08 Identify basic principles of finishing/binding operations pertaining to collating and gathering.
12.09 Identify basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.).
12.10 Identify basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart).

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 PERFORM EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents that may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Interview job applicants.
16.11 Develop and monitor safe and efficient work practices.
16.12 Stimulate, motivate and direct the development of others.
16.13 Interact affectively with customers and vendors.
16.14 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Graphic Design Technology

CODE NUMBER: Secondary ______ Postsecondary ______

Florida CIP 0650.040200

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ___Other______________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as artist and related workers (34035178), graphic designers (141.061-018) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, illustration, style/technique medium, concept formulation, design, drawing, lettering, display/exhibit design, layout, paste-up and mechanical preparation, printing processes, air-brush techniques, use of industry tools and equipment, use and care of materials, use of current industry standards/practices/techniques, typography, photographic procedures, color theorem, marketing/advertising theorem, outdoor advertising, T. V. graphics, computer-aided layout, and portfolio development.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in illustration, concept formulation, design, drawing, lettering, display/exhibit design, layout, paste-up and mechanical preparation, air-brush techniques, use of tools and equipment, use of materials, use of techniques/practices/standards, typography, photographic procedures, color application, outdoor advertising design, T. V. graphics, computer aided layout, and portfolio development.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate effective communication skills.
02. Demonstrate leadership skills.
03. Demonstrate safe and efficient work practices.
04. Perform illustrations.
05. Demonstrate style/techniques.
06. Demonstrate mediums.
07. Formulate concepts/theory.
08. Apply design theories.
09. Demonstrate drawing techniques.
10. Letter effectively.
11. Create exhibit/display designs.
12. Create advertising layouts.
13. Perform paste-ups.
14. Printing processes.
15. Interpret printing process.
16. Create airbrush illustrations.
17. Demonstrate proper use of industry tools and equipment.
18. Demonstrate proper use and care of industry materials.
19. Demonstrate knowledge of current industry standards, practices, techniques.
20. Demonstrate creative use of typography.
21. Create outdoor advertising design.
22. Interpret photographic procedures.
23. Apply marketing/advertising theories.
24. Apply color theories.
25. Develop industry-level portfolios.
26. Design television graphics.
27. Create computer-aided layouts.
28. Demonstrate appropriate math skills.
29. Demonstrate appropriate understanding of basic science.
30. Demonstrate employability skills.
31. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER:
PROGRAM TITLE: Graphic Design Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE EFFECTIVE COMMUNICATION SKILLS--The student will be able to:

01.01 Demonstrate presentation skills.
01.02 Prepare written correspondence.
01.03 Demonstrate good telephone technique.
01.04 Read and interpret written and oral instructions.

02.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

02.01 Demonstrate management abilities.
02.02 Demonstrate leadership qualities.

03.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

03.01 Follow industry rules, safety regulations and policies.
03.02 Demonstrate proper use of toxic materials.

04.0 PERFORM ILLUSTRATION--The student will be able to:

04.01 Create line art.
04.02 Demonstrate hard and soft line illustrations.
04.03 Demonstrate transparent and opaque techniques.
04.04 Create cartoons, caricatures, and animations.
04.05 Create fashion illustration.
04.06 Develop illustration skills and techniques.
04.07 Apply screen tints and color films for illustrations.

05.0 DEMONSTRATE STYLE TECHNIQUES--The student will be able to:

05.01 Select appropriate style or technique to problem solving.
05.02 Display creative talent and ingenuity.

06.0 DEMONSTRATE MEDIUMS--The student will be able to:

06.01 Apply/use a variety of artistic media.

07.0 FORMULATE CONCEPT/THEORY--The student will be able to:

07.01 Apply principles of design.
07.02 Demonstrate the design process.

08.0 APPLY DESIGN THEORIES--The student will be able to:

08.01 Create a design in black and white or color.
08.02 Create various mockups and dummies.
08.03 Produce quality comprehensive layouts in a variety of formats.

09.0 DEMONSTRATE DRAWING TECHNIQUES--The student will be able to:

09.01 Draw three dimensional shapes.
09.02 Draw still life.
09.03 Draw figures.
09.04 Demonstrate use of perspective.

10.0 LETTER EFFECTIVELY--The student will be able to:

10.01 Choose appropriate letter styles.
10.02 Utilize pen, brush, marker, and pencil lettering.
10.03 Demonstrate correct spacing of letters.
10.04 Demonstrate creative calligraphic lettering.

11.0 CREATE EXHIBIT/DISPLAY DESIGNS--The student will be able to:

11.01 Apply 2D or 3D design principles.
11.02 Construct scale models.
11.03 Indicate proper specifications for design.
11.04 Coordinate production of displays and exhibits.

12.0 CREATE ADVERTISING LAYOUTS--The student will be able to:

12.01 Produce comprehensive layouts for advertising in newspaper, advertising, magazines, billboards, and a advertising campaign.
12.02 Identify advertising needs and develop appropriate solution.

13.0 PERFORM PASTE-UPS--The student will be able to:

13.01 Demonstrate paste-up techniques.
13.02 Perform cropping of photograph and sizing of illustrations.
13.03 Prepare mechanicals "one-color, two-color, three-color, four-color" separations.
13.04 Prepare amberlith overlays.
13.05 Demonstrate techniques for knockouts and dropouts.
13.06 Demonstrate proper registration of color and overlays.
13.07 Demonstrate proper clean-up opaquing procedures.

14.0 PRINTING PROCESSES--The student will be able to:

14.01 Analyze and identify method of proofing.
14.02 Determine methods of printing.
14.03 Select stocks and inks.
14.04 Explain color separation process.
14.05 Identify and specify half-tone and line negatives.
14.06 Interpret stripping procedures.
14.07 Identify specialty printing methods.

15.0 INTERPRET PRINTING PROCESS--The student will be able to:

15.01 Identify special printing methods.
15.02 Explain basic print process.
15.03 Interpret signature and imposition procedures.

16.0 CREATE AIR BRUSH ILLUSTRATIONS--The student will be able to:

16.01 Operate and maintain air brush and air supply.
16.02 Determine proper air brush technique.
16.03 Select proper surface and paint.
16.04 Apply masking materials.
16.05 Perform photo-retouching (color) (b+w).

17.0 DEMONSTRATE PROPER USE OF INDUSTRY TOOLS AND EQUIPMENT--The student will be able to:

17.01 Operate and maintain drafting equipment.
17.02 Utilize and read various scales.

18.0 DEMONSTRATE PROPER USE AND CARE OF INDUSTRY MATERIALS--The student will be able to:

18.01 Operate and maintain camera and processor (Photostats).
18.02 Operate and maintain galley art waxer.

19.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS, PRACTICES TECHNIQUES--The student will be able to:

19.01 Explain copyright procedures.
19.02 Utilize industry terminology.
19.03 Identify industry practice and procedures.
19.04 Explain importance of meeting deadlines.
19.05 Acquire up-to-date in-field technology.
19.06 Learn how to cope with stress.
19.07 Adjust to work conditions.
19.08 Adapt properly to interdepartmental communications.
19.09 Identify clip-art images.

20.0 DEMONSTRATE CREATIVE USE OF TYPOGRAPHY--The student will be able to:

20.01 Apply dry transfer lettering.
20.02 Develop knowledge of type styles.
20.03 Demonstrate knowledge of typographical specifications.
20.04 Develop knowledge of type construction design.
20.05 Allow proper letters and line spaces for typesetting.
20.06 Develop working knowledge of typespacing.

21.0 CREATE OUTDOOR ADVERTISING DESIGN--The student will be able to:

21.01 Develop billboard and poster design.
21.02 Prepare scale art.
21.03 Apply specific design principles to outdoor situations.

22.0 INTERPRET PHOTOGRAPHIC PROCEDURES--The student will be able to:

22.01 Coordinate photographic procedures with photographer.
22.02 Perform cropping and scaling.
22.03 Prepare art cards for multi-media.
22.04 Apply specification terminology.
22.05 Operate camera.
22.06 Identify graphic arts photo principles and practices.
22.07 Create an artistic photographic image.
22.08 Utilize the photographic procedures.
22.09 Produce a half-tone screen image.

23.0 APPLY MARKETING/ADVERTISING THEORIES--The student will be able to:

23.01 Apply marketing/advertising theories.
23.02 Identify customer needs.
23.03 Identify target market.
23.04 Prepare cost estimate.
23.05 Analyze marketing potential.
23.06 Recognize proper use of specialty services (supplies, specialties).
23.07 Identify marketing procedures.
23.08 Identify advertising procedures.
23.09 Interpret advertising agency skills and procedures.

24.0 APPLY COLOR THEORIES--The student will be able to:

24.01 Use color for impact.
24.02 Apply color symbolically (psychology).

24.03 Develop knowledge of color theory.
24.04 Apply color theory and appropriate principles for use in design.

25.0 DESIGN INDUSTRY LEVEL PORTFOLIOS--The student will be able to:

25.01 Demonstrate mounting and matting procedure.
25.02 Demonstrate industry presentation procedure and techniques.
25.03 Prepare industry level portfolio.

26.0 DESIGN TELEVISION GRAPHICS--The student will be able to:

26.01 Produce T.V. story boards.
26.02 Create T.V. art cards.

27.0 CREATE COMPUTER-AIDED LAYOUTS--The student will be able to:

27.01 Perform pagination.
27.02 Create color graphics.
27.03 Create computer illustration.

28.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

28.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
28.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
28.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
28.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
28.05 Demonstrate an understanding of federal, state and local taxes and their computation.

29.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

29.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
29.02 Draw conclusions or make inferences from data.
29.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
29.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

30.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

30.01 Conduct a job search.
30.02 Secure information about a job.
30.03 Identify documents which may be required when applying for a job interview.
30.04 Complete a job application form correctly.
30.05 Demonstrate competence in job interview techniques.
30.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
30.07 Identify acceptable work habits.
30.08 Demonstrate knowledge of how to make appropriate job changes.
30.09 Demonstrate acceptable employee health habits.
30.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be

able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Heavy Duty Truck and Bus Mechanics

CODE NUMBER: Secondary______ Postsecondary I470605

Florida CIP 0647.060501

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): _____7-9 _____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DESEL MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as truck and bus mechanics, (625.281-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: maintaining and repairing diesel engines and electrical systems; reconditioning diesel fuel injection systems; overhauling diesel engines; performing diesel engine preventive maintenance and repairing chassis of heavy trucks and buses.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: troubleshooting and repair of specialty areas including Caterpillar diesel mechanics, Cummins diesel mechanics, IHC and Mack diesel mechanics.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number

corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing diesel trade skills.
02. Demonstrate proficiency in applying electrical principles.
03. Demonstrate proficiency in applying electronic principles.
04. Demonstrate proficiency in maintaining and repairing gasoline and diesel engines.
05. Demonstrate proficiency in maintaining and repairing electrical systems.
06. Demonstrate proficiency in reconditioning diesel fuel injection systems.
07. Demonstrate proficiency in reconditioning gasoline engine components.
08. Demonstrate proficiency in reconditioning diesel engine components.
09. Demonstrate proficiency in maintaining and repairing power train systems and components.
10. Demonstrate proficiency in maintaining and repairing brake systems.
11. Demonstrate proficiency in maintaining and repairing chassis components.
12. Demonstrate proficiency in maintaining and repairing hydraulic systems.
13. Demonstrate proficiency in maintaining and repairing air conditioning and heating systems.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — SECONDARY NUMBER:

PROGRAM TITLE: Heavy Duty Truck and Bus Mechanics — POSTSECONDARY NUMBER: I470605

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS--The student will be able to:

01.01 Follow safety practices
01.02 Apply basic math skills.
01.03 Apply intermediate math skills.
01.04 Recognize, identify and make metric conversions.
01.05 Perform basic welding skills.
01.06 Use hand tools.
01.07 Use power tools.
01.08 Use measuring and precision tools.
01.09 Identify types of bearings and seals.
01.10 Identify power train components and functions.
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.12 Read and use parts manuals.
01.13 Read, interpret and apply service manuals.

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES--The student will be able to:

02.01 Identify the nature of electricity.
02.02 Analyze electrical circuits.
02.03 Define Ohm's and Kirchhoff's laws.
02.04 Identify magnetism and electromagnetic induction.
02.05 Identify applications of alternating current.
02.06 Identify principles of direct-current (DC) motors and generators.
02.07 Identify principles of alternating-current (AC) motors.
02.08 Locate and match electrical units by their symbols on a wiring diagram.
02.09 Set up and use voltmeters, ammeters and ohmmeters.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES--The student will be able to:

03.01 Identify principles of diodes and rectifiers.
03.02 Identify principles of voltage regulation and power supply circuits.
03.03 Identify principles of transistors.
03.04 Identify principles of the silicon controlled rectifier (SCR).
03.05 Identify component of electronic systems and their functions.

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING GASOLINE AND DIESEL ENGINES--The student will be able to:

04.01 Identify gasoline and diesel engine operating principles (two- and four-stroke cycle engines).
04.02 Identify components of two- and four-stroke cycle engines.
04.03 Troubleshoot and repair lubrication systems.
04.04 Troubleshoot and repair induction and exhaust systems.

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS--The student will be able to:

05.01 Test and service batteries.

05.02 Test and repair starting systems.
05.03 Test and repair DC charging systems.
05.04 Test and repair ignition systems.
05.05 Test and repair lighting and accessories systems.
05.06 Test and service instruments and gauges.

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS--The student will be able to:

06.01 Identify fuel injection systems principles and components.
06.02 Troubleshoot fuel injection systems and components.
06.03 Remove, replace and adjust fuel injection systems and components.
06.04 Identify governor types and operating principles.
06.05 Troubleshoot governors.
06.06 Remove, repair or replace and adjust governors.

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING GASOLINE ENGINE COMPONENTS--The student will be able to:

07.01 Explain the basic principles of the operation of the four-stroke cycle gasoline engine.
07.02 Identify engine assemblies and systems.
07.03 Diagnose valve and head problems by use of the visual inspection method.
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method.
07.05 Diagnose valve and head problems by use of the stethoscope method.
07.06 Disassemble engines.
07.07 Clean and inspect heads for cracks, warpage and valve guides.
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear and valve seat.
07.09 Grind valve seats and reface valves.
07.10 Check and inspect springs for free height, distortion and installed height.
07.11 Adjust valve lash.
07.12 Remove and inspect camshaft bearings and lifters.
07.13 Time valve drive assemblies.
07.14 Remove pistons from rod assemblies.
07.15 Measure out-of-round and cylinder taper with a dial bore gauge.
07.16 Check piston pins and boss for wear.
07.17 Measure piston ring lands width, out-of-round and taper.
07.18 Measure the piston ring gap in a cylinder bore.
07.19 Install and fit piston pins.
07.20 Check rod and piston assembly alignment.
07.21 Remove and replace rod bearings.
07.22 Hone and clean cylinders.
07.23 Install rings on pistons.
07.24 Measure and check crankshafts with a micrometer.
07.25 Check the bearing bore with a telescoping gauge.
07.26 Reassemble engines using a plastic gauge.
07.27 Install oil seals.
07.28 Check for end play.

08.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS--The student will be able to:

08.01 Explain the basic principles of the operation of the four-stroke cycle diesel engine.
08.02 Identify engine assemblies and systems.
08.03 Diagnose valve and head problems by use of the visual inspection method.
08.04 Diagnose valve and head problems by use of the compression tester

method or cylinder air pressure method.
08.05 Diagnose valve and head problems by use of the stethoscope method.
08.06 Disassemble engines.
08.07 Clean and inspect heads for cracks, warpage and injector sleeves.
08.08 Inspect valves for warpage, burns, cracks, stem war, tip wear and valve seat.
08.09 Grind valve seats and reface valves.
08.10 Check and inspect springs for free height, distortion and installed height.
08.11 Adjust valve lash.
08.12 Remove and inspect camshaft bearings and lifters.
08.13 Time valve drive assemblies.
08.14 Remove pistons from rod assemblies.
08.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer.
08.16 Check piston pins and boss for wear.
08.17 Measure piston ring lands width, out-of-round and taper.
08.18 Measure the piston ring gap in a cylinder bore.
08.19 Install and fit piston pins.
08.20 Check rod and piston assembly alignment.
08.21 Remove and replace rod bearings.
08.22 Hone and clean cylinders.
08.23 Install rings on pistons.
08.24 Measure and check crankshafts with a micrometer.
08.25 Check the bearing bore with a telescoping gauge.
08.26 Reassemble engines using a plastic gauge.
08.27 Install oil seals.
08.28 Check for end play.

09.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING POWER TRAIN SYSTEMS AND COMPONENTS--The student will be able to:

09.01 Identify power train operating principles and components.
09.02 Troubleshoot power trains.
09.03 Recondition clutches.
09.04 Recondition standard transmissions.
09.05 Recondition automatic transmissions.
09.06 Recondition differentials and final drives.
09.07 Recondition drive lines.
09.08 Recondition power takeoffs.
09.09 Recondition transfer cases.

10.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING BRAKE SYSTEMS--The student will be able to:

10.01 Identify air brake principles and components.
10.02 Identify hydraulic brake principles and components.
10.03 Identify parking brake principles and components.
10.04 Troubleshoot brake systems.
10.05 Service and recondition hydraulic brake systems.
10.06 Service and recondition air brake systems.
10.07 Service and recondition engine brakes.
10.08 Service and recondition parking brakes.

11.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING CHASSIS COMPONENTS--The student will be able to:

11.01 Recondition conventional steering systems.
11.02 Recondition hydraulic steering systems.
11.03 Recondition rear axle suspensions.
11.04 Recondition front axle suspensions.
11.05 Service wheels, bearings, hubs and seals.

11.06 Service tires.
11.07 Recondition fifth wheels.

12.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING HYDRAULIC SYSTEMS--The student will be able to:

12.01 Identify basic principles of hydraulics.
12.02 Identify operating components of hydraulic systems.
12.03 Locate and match hydraulic units by their symbols on a diagram.
12.04 Troubleshoot hydraulic circuits using test equipment.
12.05 Maintain hydraulic fluid, filters, lines and reservoirs.
12.06 Recondition hydraulic pumps and motors.
12.07 Recondition control valves.
12.08 Recondition hydraulic cylinders.
12.09 Recondition hydraulic accessories.

13.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING AIR CONDITIONING AND HEATING SYSTEMS--The student will be able to:

13.01 Inspect and pressure test a basic air conditioning (AC) system.
13.02 Inspect, remove and replace compressor belts.
13.03 Discharge, evacuate and charge a basic AC system.
13.04 Leak test a basic AC system.
13.05 Service AC electrical circuits.
13.06 Service vacuum circuits.
13.07 Diagnose basic AC system problems.
13.08 Remove and replace components in basic AC systems.
13.09 Remove and replace engine fan clutches.
13.10 Service air conditioning systems.
13.11 Service heating systems.
13.12 Remove and replace blower motors.
13.13 Diagnose heater malfunctions.
13.14 Remove and replace heater cores, control units and cables.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student

will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents that may be required when applying for a job.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Heavy Equipment Mechanics

CODE NUMBER: Secondary _______ Postsecondary I470302

Florida CIP 0647.030200

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ____9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DESEL MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as mobile heavy equipment mechanics (85314635), construction equipment mechanics (620.261-022), industrial truck mechanics (620.281-050), maintenance mechanics (620.281-046), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, troubleshooting, preventative maintenance, and repair of heavy equipment, including engines and components, and test operation of equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in maintenance, repair and rebuilding components of heavy equipment including engines, electrical systems, fuel systems, tracks, brake systems, hydraulic systems, power transfer and drive systems, and chassis. Test operation of repaired equipment is included.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of safety, communication and leadership skills required in the trade.
02. Demonstrate the use and care of hand tools, power tools, and equipment.
03. Identify engine components.
04. Maintain, troubleshoot, and overhaul heavy equipment engines.
05. Maintain, troubleshoot, and repair electrical systems.
06. Maintain, troubleshoot, and repair fuel systems.
07. Maintain and repair track systems.
08. Maintain and repair mechanical, hydraulic, and air brake systems.
09. Maintain, troubleshoot, and repair hydraulic systems.
10. Maintain, troubleshoot, and repair winches, clutches and transmissions.
11. Maintain, troubleshoot and repair differentials, final drives, and drivelines.
12. Inspect and repair chassis.
13. Test drive equipment.
14. Demonstrate ability to perform preventative maintenance and complete oil analysis program.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER:
PROGRAM TITLE: Heavy Equipment Mechanics POSTSECONDARY NUMBER: I470302

01.0 DEMONSTRATE KNOWLEDGE OF SAFETY, COMMUNICATION AND LEADERSHIP SKILLS REQUIRED IN THE TRADE--The student will be able to:

01.01 Comply with all safety rules and regulations.
01.02 Use all tools properly. (Only for their intended purpose).
01.03 Read, interpret and apply service, manual knowledge to the satisfaction of the instructor.
01.04 Perform all assigned tasks utilizing integrity and doing your best work.

02.0 DEMONSTRATE THE USE AND CARE OF HAND TOOLS, POWER TOOLS, AND EQUIPMENT--The student will be able to:

02.01 Perform assigned tasks utilizing hand tools, power tools and equipment to the satisfaction of the instructor.
02.02 List basic rules concerning proper care of tools and equipment.
02.03 Identify safety methods utilized and steps to follow under an emergency type condition.

03.0 IDENTIFY ENGINE COMPONENTS--The student will be able to:

03.01 Identify each engine component from pictured materials by matching that component to its proper title and purpose.
03.02 Identify engine components displayed within the shop area to the satisfaction of the assigned instructor.

04.0 MAINTAIN, TROUBLESHOOT, AND OVERHAUL HEAVY EQUIPMENT ENGINES--The student will be able to:

04.01 Remove and replace cylinder head(s).
04.02 Remove and replace valves, springs, retainers and keepers.
04.03 Clean cylinder head and check it for cracks.
04.04 Reface valves.
04.05 Grind valve seats.
04.06 Check valve guides.
04.07 Remove, check and replace oil pan.
04.08 Remove piston and rod assemblies.
04.09 Clean piston and ring grooves.
04.10 Install piston rings.
04.11 Install piston and rod assemblies in block.
04.12 Check cylinder head for warpage.
04.13 Check cylinder block for warpage and cracks.
04.14 Tap-out threaded holes.
04.15 Remove and replace timing gear cover.
04.16 Remove and replace flywheel and flywheel housing.
04.17 Install front and rear crankshaft seal.
04.18 Remove crankshaft.
04.19 Measure crankshaft (main and rod journals).
04.20 Install main bearings.
04.21 Install rod bearings.
04.22 Check installed main and rod bearing clearance.
04.23 Torque main bearing and rod bearing caps.
04.24 Torque cylinder head(s).
04.25 Adjust valves.
04.25 Adjust injectors and injection control rack.

04.27 Remove and install water pump.
04.28 Remove and install oil pump.
04.29 Dissemble and re-assemble oil pump.
04.30 Remove and install injection pump.
04.31 Remove and install turbocharger.
04.32 Remove and install blower.
04.33 Disassemble and reassemble blower.
04.34 Measure blower clearances.
04.35 Remove and install vibration damper.
04.36 Adjust governor.
04.37 Set idle speeds (low and high).
04.38 Remove and install air and oil filter.

05.0 MAINTAIN, TROUBLESHOOT, AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

05.01 Remove, clean and install battery.
05.02 Install batteries correctly where two or more batteries are utilized.
05.03 Install battery cables correctly for a series hook-up.
05.04 Visually inspect a battery.
05.05 Test battery with hydrometer, voltmeter and load tester.
05.06 Make connections and charge a battery.
05.07 Remove a starter and install starter.
05.08 Troubleshoot an electrical starting system.
05.09 Replace a starter drive.
05.10 Replace starter motor brushes and solenoid.
05.11 Troubleshoot starter motor on vehicle.
05.12 Troubleshoot starter motor on bench.
05.13 Test armature for shorts, grounds and opens.
05.14 Test field coils for opens and grounds.
05.15 Remove and replace alternator.
05.16 Troubleshoot an electrical charging system with alternator.
05.17 Test alternator rotor for grounds, shorts and opens.
05.18 Test alternator starter windings for grounds and opens.
05.19 Test and replace regulator.

06.0 MAINTAIN,TROUBLESHOOT, AND REPAIR FUEL SYSTEMS--The student will be able to:

06.01 Adjust engine high speed.
06.02 Adjust engine idle.
06.03 Bleed fuel system.
06.04 Calibrate governor.
06.05 Clean injector.
06.06 Install and time fuel injection pump.
06.07 Replace fuel filters.
06.08 Replace fuel injector.
06.09 Troubleshoot fuel injection pump.
06.10 Troubleshoot fuel injector.

07.0 MAINTAIN AND REPAIR TRACK SYSTEMS--The student will be able to:

07.01 Remove and replace track assembly, master pin type.
07.02 Remove and replace track assembly, split master link type.
07.03 Replace bolt on sprocket segments.
07.04 Measure track assembly for wear, link height, internal pin and bushing and external bushing.
07.05 Measure sprocket for wear.
07.06 Measure bottom rollers for wear.
07.07 Measure top rollers for wear.
07.08 Measure idler for wear.

07.09 Align roller frame to sprocket.
07.10 Align top roller and idler to sprocket.
07.11 Remove and replace roller frame.
07.12 Remove and replace top rollers.
07.13 Remove and replace bottom rollers.
07.14 Repair bottom rollers.
07.15 Repair top rollers.

08.0 MAINTAIN AND REPAIR MECHANICAL, HYDRAULIC, AND AIR BRAKE SYSTEMS--The student will be able to:

08.01 Remove and replace brake master cylinder.
08.02 Bleed air from brake master cylinder.
08.03 Rebuild single piston master cylinder.
08.04 Remove, repair and replace necessary items in a drum type brake assembly.
08.05 Adjust drum type brakes.
08.06 Rebuild brake cylinder.
08.07 Measure for wear on brake drum.
08.08 Remove and replace caliper on disk type brake.
08.09 Rebuild caliper assembly.
08.10 Replace brake pads.
08.11 Bleed air from brakes.
08.12 Measure disk for wear.
08.13 Remove, repair and reassemble cam type air drum brake.
08.14 Remove, repair and reassemble wedge type air drum brake.
08.15 Adjust slack adjuster on cam type air drum brake.
08.16 Rebuild air chamber (single and double chamber).
08.17 Remove, repack, replace and adjust wheel bearings.
08.18 Troubleshoot vacuum booster.
08.19 Troubleshoot hydrovac booster.
08.20 Service air brake system.
08.21 Repair air compressor.
08.22 Adjust air compressor governor.

09.0 MAINTAIN, TROUBLESHOOT, AND REPAIR HYDRAULIC SYSTEMS--The student will be able to:

09.01 Drain and refill hydraulic reservoir making all checks for contaminated fluid.
09.02 Remove and replace all hydraulic system screens and filters.
09.03 Remove and replace hydraulic hoses and metal lines.
09.04 Remove and replace hydraulic system oil pump.
09.05 Rebuild gear and vane type pump.
09.06 Troubleshoot hydraulic pump.
09.07 Check oil pressure.
09.08 Adjust relief valve.
09.09 Remove and replace hydraulic control valves.
09.10 Repair hydraulic control valves.
09.11 Troubleshoot hydraulic control valve.
09.12 Remove and replace hydraulic cylinder.
09.13 Rebuild hydraulic cylinder.
09.14 Troubleshoot hydraulic cylinder.

10.0 MAINTAIN, TROUBLESHOOT, AND REPAIR WINCHES, CLUTCHES AND TRANSMISSIONS--The student will be able to:

10.01 Demonstrate knowledge and ability to troubleshoot, maintain and repair winches.
10.02 Remove and replace steering clutch and steering brake.
10.03 Rebuild steering clutch.
10.04 Adjust push type master clutch.

10.05 Adjust pull type master clutch.
10.06 Inspect flywheel surface for wear or cracks.
10.07 Remove and replace push type master clutch, single or double disk.
10.08 Remove and replace pull type master clutch, single or double disk.
10.09 Replace pilot bearing.
10.10 Replace clutch stop brake.
10.11 Replace clutch release bearing.
10.12 Remove and replace truck transmission.
10.13 Rebuild manual transmission.
10.14 Adjust linkage.
10.15 Remove and replace power shift torque converter.
10.16 Rebuild torque converter.
10.17 Remove and replace power shift transmission.
10.18 Rebuild power shift transmission.
10.19 Adjust linkage on power shift transmission.

11.0 MAINTAIN, TROUBLESHOOT AND REPAIR DIFFERENTIALS, FINAL DRIVES, AND DRIVELINES--The student will be able to:

11.01 Remove and replace sprocket assembly with seals.
11.02 Remove and replace final drive assembly.
11.03 Remove, replace and adjust bevel gear and shaft.
11.04 Set bevel gear and pinion clearance.
11.05 Inspect drive shaft for correct timing.
11.06 Replace universal joints.
11.07 Adjust ring gear shaft for correct bearing preload.
11.08 Adjust pinion shaft for correct bearing preload.
11.09 Adjust pinion shaft for correct bearing alignment depth.
11.10 Adjust ring gear to pinion clearance.

12.0 INSPECT AND REPAIR CHASSIS--The student will be able to:

12.01 Demonstrate general knowledge of chassis damage assessment and repairs verbally or by written examination.

13.0 TEST DRIVE EQUIPMENT--The student will be able to:

13.01 Identify needed repairs to the instructor from test driving equipment where liability and safety allow such tests.

14.0 DEMONSTRATE ABILITY TO PERFORM PREVENTATIVE MAINTENANCE AND COMPLETE OIL ANALYSIS PROGRAM--The student will be able to:

14.01 Student must check all fluids, air, electrical systems, undercarriage components etc. and perform needed service or repair to the satisfaction of the instructor.
14.02 Student must demonstrate ability to remove oil sample for oil analysis.
14.03 Student must be able to explain the importance of the oil analysis verbally or by written exam.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by

evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Heavy Equipment Operation

CODE NUMBER: Secondary ______ Postsecondary I490202

Florida CIP 0649.020200

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: OPER ENGR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as operating engineers (97956953), (859.683-010) or to provide supplemental training for persons previously or currently employed in these occupations. Students may elect to train on individual machines of their choice as a certification option.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to operate and maintain a variety of heavy equipment as crawler tractors, motor graders, scrapers and shovels or cranes. Students training on one machine must complete all related program content.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in digging, ditching, sloping, stripping, grading, backfilling, clearing, excavating, and equipment maintenance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1440 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures.
02. Demonstrate understanding of operation and maintenance of mechanical systems and engines.
03. Operate pneumatic and crawler-type tractor with attachments.
04. Operate a back hoe.
05. Operate a motor grader.
06. Operate a crane.
07. Utilize utility construction equipment as applicable.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Heavy Equipment Operation POSTSECONDARY NUMBER: 1490202

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES--The student will be able to:

01.01 Apply safety practices during operation of heavy equipment.
01.02 Discuss function of each piece of heavy equipment as appropriate.
01.03 Turn and back-up equipment safely.
01.04 Operate equipment on roadway safely.

02.0 DEMONSTRATE UNDERSTANDING OF OPERATION AND MAINTENANCE OF MECHANICAL SYSTEMS AND ENGINES--The student will be able to:

02.01 Perform preventive maintenance on equipment including greasing, changing oil, and replacing filters.
02.02 Perform additional maintenance based on specific equipment needs.
02.03 Safety check equipment prior to operation.

03.0 OPERATE PNEUMATIC AND CRAWLER-TYPE TRACTOR WITH ATTACHMENTS--The student will be able to:

03.01 Move, level, and spread top soil.
03.02 Remove stumps.
03.03 Pile debris for burning.
03.04 Remove and replace dozer blade.
03.05 Remove and replace bucket.
03.06 Attach cutting teeth as needed.
03.07 Safely load dump trucks.

04.0 OPERATE BACK HOE--The student will be able to:

04.01 Dig pit to specified grade.
04.02 Observe for cables, pipes, and underground utilities.
04.03 Dig ditches for drainage and pipes.
04.04 Install bucket teeth to back hoe

05.0 OPERATE A MOTOR GRADER--The student will be able to:

05.01 Grade to specific levels.
05.02 Apply use of grading stakes when operating motor grade.
05.03 Build a road-bed.
05.04 Perform blue-top grade (finish).
05.05 Change blade and scarifier teeth on motor grader.

06.0 OPERATE A CRANE--The student will be able to:

06.01 Apply crane safety procedures.
06.02 Review Construction Industry Manufactures Association safety manuals.
06.03 Operate crane with drag bucket, clam-shell, and hook.
06.04 Load dump truck with crane.

07.0 UTILIZE UTILITY CONSTRUCTION EQUIPMENT AS APPLICABLE--The student will be able to:

07.01 Operate scraper.
07.02 Operate trencher.
07.03 Operate tar kettle.

07.04 Operate rollers.
07.05 Operate concrete mixer.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Cooperative Education-OJT

CODE NUMBER: Secondary 8700400 Postsecondary I469999

Florida CIP 0646.9999CP

SECONDARY SCHOOL CREDITS Multiple COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 30,31

CERTIFICATION COVERAGE: ANY INDUSTRIAL ED G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide the on-the-job training component when the cooperative method of instruction is to be used and is implemented after an appropriate level of competency has been attained in an in-school job preparatory program. This method prepares students for employment in industrial occupations. On-the-job experiences are provided as a component of the job preparatory program to develop and reinforce occupational competencies required for employment in the occupation chosen as a career. These experiences further develop competencies acquired by the student in in-school job preparatory programs. This method of delivery is not intended for supplemental vocational course instruction and shall not be claimed for supplemental FTE purposes.

The course content will include the following: accompanying related instruction; and the applied skill and knowledge required for the chosen occupation.

The course content should also include employability skills training in communication, leadership, human relations, teamwork; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Training at a job site is the primary component of this instructional strategy. Students acquire competencies and job skills necessary to meet industry standards and correspondent program standards.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The ICE - OJT course may be taken by a student for one or more semesters. A student may earn multiple credits in this course. The specific student performance standards which the student must achieve to earn credit must be specified in the OJT training plan.

*The typical length of this course(s) and number of credits for a particular student will depend upon previous levels of competency attainment and complexity of the chosen occupation as outlined in the training plan and may be combined with the correspondent job preparatory program to arrive at the total.

Outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate job related skills for the chosen occupation.
02. Demonstrate an understanding of entrepreneurship.
03. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8700400

PROGRAM TITLE: Industrial Cooperative Education - OJT
POSTSECONDARY NUMBER: I469999

01.0 DEMONSTRATE JOB RELATED SKILLS FOR THE CHOSEN OCCUPATION--The student will be able to:

01.01 Demonstrate competencies from appropriate curriculum frameworks/student performance standards, as identified in the student training plan.

02.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

02.01 Define entrepreneurship.
02.02 Describe the importance of entrepreneurship to the American economy.
02.03 List the advantages and disadvantages of business ownership.
02.04 Identify the risks involved in ownership of a business.
02.05 Identify the necessary personal characteristics of a successful entrepreneur.
02.06 Identify the business skills needed to operate a small business efficiently and effectively.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make appropriate job changes.
03.09 Demonstrate acceptable employee health habits.
03.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Education Directed Study

CODE NUMBER: Secondary 8700100 Postsecondary _______

Florida CIP 0647.999901

SECONDARY SCHOOL CREDITS Multiple COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 11-12,30,31

CERTIFICATION COVERAGE: ANY INDUSTRIAL EDUCATION G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with additional competencies in an Industrial Education program that will enhance their opportunities for employment in the occupation chosen by the student.

The content is prescribed by the instructor based upon the industrial student's assessed needs for directed study.

II. LABORATORY ACTIVITIES: A work station is provided as required to support the training activities of the student.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., (VICA) is an appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This course may be taken only by a student who has completed, or is currently completing, all of the courses prescribed in the Course Code Directory for a specific secondary job preparatory program and needs additional credits in his program. A student may earn multiple credits in this course.

Listed below are criteria for selection of students for continuance in a specific Industrial education program:

1. Student consistently makes D's on written and performance tests covering technical information and performance which is given to all students in the program.

2. Student's rate of absence continually reflects the maximum allowed by local school board policy.

3. Student regularly does not meet deadline for work assigned or does not exhibit a willingness to be punctual.

The specific student performance standards which the student must master to earn credit must be outlined in an instructional plan developed by the instructor.

The student enrolled in this course must be reported using the Course Code Directory program number for the specific job preparatory program in which the student is continuing.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Perform designated job skills.
02. Demonstrate a knowledge of the basic skills in mathematics and language appropriate for the chosen occupation.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: 8700100

PROGRAM TITLE: Industrial Education Directed Study

POSTSECONDARY NUMBER: ________

01.0 PERFORM DESIGNATED JOB SKILLS--The student will be able to:

01.01 Demonstrate job performance skills.
01.02 Follow prescribed safety procedures.
01.03 Display increasingly higher levels of productivity.

02.0 DEMONSTRATE A KNOWLEDGE OF THE BASIC SKILLS IN MATHEMATICS AND LANGUAGE APPROPRIATE FOR THE CHOSEN OCCUPATION--The student will be able to:

02.01 Use addition, subtraction, multiplication, and division to solve problems encountered in the chosen occupation.
02.02 Read, understand, and find information relative to the chosen occupation.
02.03 Write logical and grammatically correct statements and reports with correct spelling appropriate for the chosen occupation.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Electricity

CODE NUMBER: Secondary 8727000   Postsecondary ______

Florida CIP 0647.013902

SECONDARY
SCHOOL CREDITS_6_   COLLEGE CREDITS___   POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9   _x_9-12   ___Postsecondary Adult Vocational

___Postsecondary Vocational   _x_Other30,31

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians (87202549), electrical repairers (829.281-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: assembly, installation, operation, maintenance and repair of electrical equipment used in manufacturing and industry.

The course content should also include training in communication, leadership, human relations and employability skills; and safe efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8727010	Industrial Electricity 1
8727020	Industrial Electricity 2
8727030	Industrial Electricity 3
8727040	Industrial Electricity 4
8727050	Industrial Electricity 5
8727060	Industrial Electricity 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry. Students are also instructed in the following: servicing, maintaining and using equipment which includes lighting, motors, conduit (raceway) systems and related equipment in accordance with the National Electrical Code.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work

station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate industrial wiring skills.
05. Install transformers.
06. Operate AC and DC rotating equipment.
07. Construct control circuits and install electrical controls and devices.
08. Repair motors.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8727000
PROGRAM TITLE: Industrial Electricity POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures.
01.02 Apply laboratory safety rules and procedures.
01.03 Demonstrate the operation of laboratory safety devices.
01.04 Demonstrate personal safety procedures.
01.05 Demonstrate first aid and emergency treatment procedures.
01.06 Apply fire safety rules and procedures.
01.07 Apply electrical safety rules and procedures.
01.08 Demonstrate procedures for disaster situations.
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers.
01.10 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers.
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers.
01.12 Convert decimals to fractions and fractions to decimals.
01.13 Convert English measure to metric measure and metric measure to English measure.
01.14 Solder and desolder components.
01.15 Drill holes in metal or plastic chassis.
01.16 Measure voltage in a simple circuit.
01.17 Measure amperage in a simple circuit.
01.18 Measure resistance in a simple circuit.
01.19 Produce voltage by chemical means.
01.20 Produce voltage by mechanical means.
01.21 Produce voltage by thermal means.
01.22 Produce voltage by photoelectric means.
01.23 Identify physical and mechanical abilities of the electrical trade.
01.24 Demonstrate use and care of ladders.
01.25 Demonstrate use and care of tools.
01.26 Demonstrate use of shovels and axes.
01.27 Prepare a trench for conduit.
01.28 Backfill and compact a conduit trench.
01.29 Organize storage areas on site.
01.30 Demonstrate service truck loading procedures.
01.31 Perform daily maintenance on service trucks.
01.32 Demonstrate rigging procedures using ropes, cables and chains.
01.33 Identify use of rigging hand signals for crane operators.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity and electronics (prerequisite to DC).
02.02 Relate electricity to nature of matter.
02.03 Identify sources of electricity.
02.04 Define voltage, current, resistance, power, and energy.
02.05 Apply and relate Ohm's law.
02.06 Measure properties of a circuit using volt-ohm meters (VOM) and digital volt-ohm meters (DVM).
02.07 Compute and measure conductance and resistance of conductors and insulators.
02.08 Analyze series circuits.

02.09 Construct series circuits.
02.10 Troubleshoot series circuits.
02.11 Draw a series circuit and calculate circuit values.
02.12 Analyze parallel circuits.
02.13 Construct parallel circuits.
02.14 Troubleshoot parallel circuits.
02.15 Draw a parallel circuit and calculate circuit values.
02.16 Analyze series-parallel circuits.
02.17 Construct series-parallel circuits.
02.18 Troubleshoot series-parallel circuits.
02.19 Draw a series-parallel circuit and calculate circuit values.
02.20 Define magnetic properties of circuits and devices.
02.21 Determine the physical and electrical characteristics of capacitors and inductors.
02.22 Set up and operate a VOM for DC circuits.
02.23 Set up and operate a DVM for DC circuits.
02.24 Set up and operate power supplies for DC circuits.
02.25 Construct an electromagnet.
02.26 Construct a simple DC generator.
02.27 Construct a simple DC motor.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and apply principles of transformers to AC circuits.
03.05 Analyze polyphase circuits.
03.06 Construct polyphase circuits.
03.07 Troubleshoot polyphase circuits.
03.08 Analyze basic motor theory and operation.
03.09 Analyze basic generator theory and operation.
03.10 Set up and operate a VOM for AC circuits.
03.11 Set up and operate a DVM for AC circuits.
03.12 Set up and operate power supplies for AC circuits.

04.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation requirements from an industrial electrical plan or drawing.
04.02 Draw an industrial electrical floor plan.
04.03 Charge a lead-acid battery.
04.04 Charge a nickel-cadmium battery.
04.05 Repair an emergency lighting system.
04.06 Install circuit breakers in a panel board.
04.07 Install and connect system grounds.
04.08 Install a distribution panel board.
04.09 Install electrical metallic tubing.
04.10 Install explosion proof equipment.
04.11 Install power and controls for air conditioning systems.
04.12 Install a fluorescent lighting fixture.
04.13 Install an incandescent lighting fixture.
04.14 Install a lighting dimmer system.
04.15 Install liquid-tight flexible metal conduit.
04.16 Install multiconductor cable.
04.17 Install a multiconduit layout.
04.18 Install a multicontrol lighting circuit.
04.19 Install non-liquid-tight flexible metal conduit.
04.20 Install plastic conduit.

04.21 Install rigid conduit.
04.22 Install the service entrance head for a service drop.
04.23 Install under floor duct work.
04.24 Install an underground service entrance.
04.25 Prepare an equipment and material list.
04.26 Complete an equipment and material order.
04.27 Receive an equipment and material order.

05.0 INSTALL TRANSFORMERS--The student will be able to:

05.01 Connect a single-phase step-down transformer.
05.02 Connect a single-phase step-up transformer.
05.03 Connect two single-phase transformers in parallel.
05.04 Connect two single-phase transformers in an open-delta configuration.
05.05 Connect a dual-voltage transformer (for high-voltage input and output).
05.06 Connect a dual-voltage transformer (for low-voltage input and output).
05.07 Connect an auto transformer to give a variety of output voltages.
05.08 Connect a single-phase distribution transformer to supply 115 and 230 volts.
05.09 Connect a three-phase power transformer for a three-phase, four-wire connection.
05.10 Connect a three-phase transformer for a three-phase, delta configuration.
05.11 Connect a three-phase power transformer for a three-phase, wye configuration.
05.12 Connect three single-phase transformers to form a delta-delta configuration.
05.13 Connect three single-phase transformers to form a delta-star configuration.
05.14 Connect three single-phase transformers to form a star-delta three-phase configuration.
05.15 Connect three single-phase transformers to form a star-star, three-phase configuration.
05.16 Install a current transformer and measure current flow.
05.17 Install a potential transformer and measure voltage.
05.18 Connect a booster transformer.
05.19 Connect a bucking transformer.

06.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

06.01 Connect a DC shunt motor.
06.02 Connect a DC series motor.
06.03 Connect a DC compound motor.
06.04 Connect a DC separately-excited shunt generator.
06.05 Connect a DC self-excited shunt generator.
06.06 Connect a DC compound generator.
06.07 Connect a DC series generator.
06.08 Connect a capacitor-start motor.
06.09 Connect a split-phase induction motor.
06.10 Connect a capacitor-run motor.
06.11 Connect a universal motor.
06.12 Connect a repulsion-start, induction-run motor.
06.13 Connect a three-phase wound-rotor induction motor.
06.14 Connect a three-phase squirrel cage induction motor.
06.15 Connect a three-phase synchronous motor.
06.16 Connect a three-phase alternator.

07.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

07.01 Draw an elementary motor-control line diagram.
07.02 Install a manual motor-control station.
07.03 Install an automatic, push-button motor-control station.
07.04 Install a three-phase-control magnetic starter.
07.05 Install a two-station, push-button control station.
07.06 Install a drum-switch control station.
07.07 Install a control circuit to change the direction of rotation of a motor.
07.08 Install a hands-off, automatic control circuit.
07.09 Install a multiple push-button station.
07.10 Install an interlocking and reversing control circuit.
07.11 Install a hand sequence control circuit.
07.12 Install an AC reduced voltage starter (resistance).
07.13 Install apart winding starter.
07.14 Install a three-phase multispeed controller.
07.15 Install a direct current motor controller.

08.0 REPAIR MOTORS--The student will be able to:

08.01 Disassemble and assemble a DC motor.
08.02 Disassemble and assemble a single-phase motor.
08.03 Disassemble and assemble a three-phase motor.
08.04 Prepare a motor data card.
08.05 Wind A DC motor.
08.06 Wind a single-phase motor.
08.07 Wind a three-phase motor.
08.08 Install and connect a motor starting switch.
08.09 Install a motor centrifugal mechanism.
08.10 Install motor bearings and bushings.
08.11 Troubleshoot and repair a DC motor.
08.12 Troubleshoot and repair a single-phase motor.
08.13 Troubleshoot and repair a three-phase motor.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the America economy.
13.03 List the advantages and disadvantager of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial Education
PROGRAM TITLE: Industrial Electricity
COURSE TITLE: Industrial Electricity 1

EFFECTIVE DATE: July, 1993
COURSE CREDIT: 1
PROGRAM NUMBER: 8727000
COURSE NUMBER: 8727010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic electrical skills with emphasis on developing proficiency in DC circuits and in laboratory practices.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures.
01.02 Apply laboratory safety rules and procedures.
01.03 Demonstrate the operation of laboratory safety devices.
01.04 Demonstrate personal safety procedures.
01.05 Demonstrate first aid and emergency treatment procedures.
01.06 Apply fire safety rules and procedures.
01.07 Apply electrical safety rules and procedures.
01.08 Demonstrate procedures for disaster situations.
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers.
01.10 Solve problems requiring addition, subtraction, multiplication and division of common fractions.
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers.
01.12 Convert decimals to fractions and fractions to decimals.
01.13 Convert English measure to metric measure and metric measure to English measure.
01.14 Solder and desolder components.
01.15 Drill holes in metal or plastic chassis.
01.16 Measure voltage in a simple circuit.
01.17 Measure resistance in a simple circuit.
01.18 Measure resistance in a simple circuit.
01.19 Produce voltage by chemical means.
01.20 Produce voltage by mechanical means.
01.21 Produce voltage by thermal means.
01.22 Produce voltage by photoelectric means.
01.23 Identify physical and mechanical abilities of the electrical trade.
01.24 Demonstrate use and care of ladders.
01.25 Demonstrate use and care of tools.
01.26 Demonstrate use of shovels and axes.
01.27 Prepare a trench for conduit.
01.28 Backfill and compact a conduit trench.
01.29 Organize storage areas on site.
01.30 Demonstrate service truck loading procedures.
01.31 Perform daily maintenance on service trucks.
01.32 Demonstrate rigging procedures using ropes, cables and chains.
01.33 Identify use of rigging hand signals for crane operators.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity and electronics (prerequisite to DC).

02.02 Relate electricity to the nature of matter.
02.03 Identify sources of electricity.
02.04 Define voltage, current, resistance, power and energy.
02.05 Apply and relate Ohm's law.
02.06 Measure properties of a circuit using volt-ohm meters (VOM) and digital volt-ohm meters (DVM).
02.07 Compute and measure conductance and resistance of conductors and insulators.
02.08 Analyze series circuits.
02.09 Construct series circuits.
02.10 Troubleshoot series circuits.
02.11 Draw a series circuit and calculate circuit values.
02.12 Analyze parallel circuits.
02.13 Construct parallel circuits.
02.14 Troubleshoot parallel circuits.
02.15 Draw a parallel circuit and calculate circuit values.
02.16 Analyze series-parallel circuits.
02.17 Construct series-parallel circuits.
02.18 Troubleshoot series-parallel circuits.
02.19 Draw a series-parallel circuit and calculate circuit values.
02.20 Define magnetic properties of circuits and devices.
02.21 Determine physical and electrical characteristics of capacitors and inductors.
02.22 Set up and operate a VOM for DC circuits.
02.23 Set up and operate a DVM for DC circuits.
02.24 Set up and operate power supplies for DC circuits.
02.25 Construct an electromagnet.
02.26 Construct a simple DC generator.
02.27 Construct a simple DC motor.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity

PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 2

COURSE NUMBER: 8727020

COURSE DESCRIPTION:

This course is designed to provide instruction in developing proficiency in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics.
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and apply principles of transformers to AC circuits.
03.05 Analyze polyphase circuits.
03.06 Construct polyphase circuits.
03.07 Troubleshoot polyphase circuits.
03.08 Analyze basic motor theory and operation.
03.09 Analyze basic generator theory and operation.
03.10 Set up and operate a VOM for AC circuits.
03.11 Set up and operate a DVM for AC circuits.
03.12 Set up and operate power supplies for AC circuits.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity

PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 3

COURSE NUMBER: 8727030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating industrial wiring skills.

04.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation requirements from an industrial electrical plan or drawing.
04.02 Draw an industrial electrical floor plan.
04.03 Charge a lead-acid battery.
04.04 Charge a nickel-cadmium battery.
04.05 Repair an emergency lighting system.
04.06 Install circuit breakers in a panel board.
04.07 Install and connect system grounds.
04.08 Install a distribution panel board.
04.09 Install electrical metallic tubing.
04.10 Install explosion proof equipment.
04.11 Install power and controls for air conditioning systems.
04.12 Install a fluorescent lighting fixture.
04.13 Install an incandescent lighting fixture.
04.14 Install a lighting dimmer system.
04.15 Install liquid-tight flexible metal conduit.
04.16 Install multiconductor cable.
04.17 Install a multiconduit layout.
04.18 Install a multicontrol lighting circuit.
04.19 Install non-liquid-tight flexible metal conduit.
04.20 Install plastic conduit.
04.21 Install rigid conduit.
04.22 Install the service entrance head for a service drop.
04.23 Install under floor duct work.
04.24 Install an underground service entrance.
04.25 Prepare an equipment and material list.
04.26 Complete an equipment and material order.
04.27 Receive an equipment and material order.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity

PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 4

COURSE NUMBER: 8727040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for installing transformers.

05.0 INSTALL TRANSFORMERS--The student will be able to:

05.01 Connect a single-phase step-down transformer.
05.02 Connect a single-phase step-up transformer.
05.03 Connect two single-phase transformers in parallel.
05.04 Connect two single-phase transformers in an open-delta configuration.
05.05 Connect a dual voltage transformer (for high-voltage input and output).
05.06 Connect a dual-voltage transformer (for low-voltage input and output).
05.07 Connect an auto transformer to give a variety of output voltages.
05.08 Connect a single-phase distribution transformer to supply 115 and 230 volts.
05.09 Connect a three-phase power transformer for a three-phase, four-wire connection.
05.10 Connect a three-phase transformer for a three-phase, delta configuration.
05.11 Connect a three-phase power transformer for a three-phase, wye configuration.
05.12 Connect three single-phase transformers to form a delta-delta configuration.
05.13 Connect three single-phase transformers to form a delta-star configuration.
05.14 Connect three single-phase transformers to form a star-delta three-phase configuration.
05.15 Connect three single-phase transformers to form a star-star, three-phase configuration.
05.16 Install a current transformer and measure current flow.
05.17 Install a potential transformer and measure voltage.
05.18 Connect a booster transformer.
05.19 Connect a bucking transformer.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 5 COURSE NUMBER: 8727050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for operating AC and DC rotating equipment, constructing control circuits, and installing control circuits, particularly electrical control circuits and devices.

06.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

06.01 Connect a DC shunt motor.
06.02 Connect a DC series motor.
06.03 Connect a DC compound motor.
06.04 Connect a DC separately-excited shunt generator.
06.05 Connect a DC self-excited shunt generator.
06.06 Connect a DC compound generator.
06.07 Connect a DC series generator.
06.08 Connect a capacitor-start motor.
06.09 Connect a split-phase induction motor.
06.10 Connect a capacitor-run motor.
06.11 Connect a universal motor.
06.12 Connect a repulsion-start, induction, run motor.

06.13 Connect a three-phase wound-rotor induction motor.
06.14 Connect a three-phase squirrel cage induction motor.
06.15 Connect a three-phase synchronous motor.
06.16 Connect a three-phase alternator.

07.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

07.01 Draw an elementary motor-control line diagram.
07.02 Install a manual motor-control station.
07.03 Install an automatic, push-button motor-control station.
07.04 Install a three-phase-control magnetic starter.
07.05 Install a two-station, push-button control station.
07.06 Install a drum-switch control station.
07.07 Install a control circuit to change the direction of rotation of a motor.
07.08 Install a hands-off, automatic control circuit.
07.09 Install a multiple push-button station.
07.10 Install an interlocking and reversing control circuit.
07.11 Install a hand sequence control circuit.
07.12 Install an AC reduced voltage starter (resistance).
07.13 Install a part winding starter.
07.14 Install a three-phase multispeed controller.
07.15 Install a direct current motor controller.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity

PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 6

COURSE NUMBER: 8727060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing motors and in developing employability skills and entrepreneurship.

08.0 REPAIR MOTORS--The student will be able to:

08.01 Disassemble and assemble a DC motor.
08.02 Disassemble and assemble a single-phase motor.
08.03 Disassemble and assemble a three-phase motor.
08.04 Prepare a motor data card.
08.05 Wind a DC motor.
08.06 Wind a single-phase motor.
08.07 Wind a three-phase motor.
08.08 Install and connect a motor starting switch.
08.09 Install a motor centrifugal mechanism.
08.10 Install motor bearings and bushings.
08.11 Troubleshoot and repair a DC motor.
08.12 Troubleshoot and repair a single-phase motor.
08.13 Troubleshoot and repair a three-phase motor.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and

industry.

09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the America economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Electronics

CODE NUMBER: Secondary ________ Postsecondary I470105

Florida CIP 0647.010500

SECONDARY SCHOOL CREDITS______ COLLEGE CREDITS______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: RADIO TV @ 7 G ELECTRONIC @ 7 G TEC ELEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electronics repairers (85717609), electronics mechanics 828.281-010. This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to, direct current (DC), alternating current (AC), analog, relay, delay and time delay circuits; solid-state and digital devices; distribution, timing and control systems; microprocessors; industrial power supplies; transformers; DC and AC motors; digital motor controls; manual controllers; magnetic controllers and starters; pressure and strain measurements; temperature, photoelectric liquid level and process control; line diagrams and logic functions; gas and humidity sensing; telemetry; systems interface; schematics; soldering and chassis assembly techniques; laboratory practices; and technical recording and reporting.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours when content from the Florida common core electronics program (Electronics Technology) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in industrial power supplies.
02. Demonstrate proficiency in power distribution systems.
03. Demonstrate proficiency in basic control systems.
04. Demonstrate proficiency in DC motors.
05. Demonstrate proficiency in digital motor control.
06. Demonstrate proficiency in manual controllers.
07. Demonstrate proficiency in magnetic controllers.
08. Demonstrate proficiency in pressure and strain measurements.
09. Demonstrate proficiency in temperature control.
10. Demonstrate proficiency in photoelectric control.
11. Demonstrate proficiency in gas and humidity sensors.
12. Demonstrate proficiency in liquid level controls.
13. Demonstrate proficiency in line diagrams and logic functions.
14. Demonstrate proficiency in timing systems.
15. Demonstrate proficiency in time delay circuits.
16. Demonstrate proficiency in process control.
17. Demonstrate proficiency in telemetry.
18. Demonstrate proficiency in systems interface.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Industrial Electronics POSTSECONDARY NUMBER: I470105

01.0 DEMONSTRATE PROFICIENCY IN INDUSTRIAL POWER SUPPLIES--The student will be able to:

01.01 Connect an unregulated power supply, measure voltages and calculate percentage of regulation.
01.02 Decrease the power supply impedance to improve regulation.
01.03 Connect a shunt regulator circuit.
01.04 Connect a series regulator circuit.
01.05 Connect a switching voltage regulator.
01.06 Set up a DC-to-AC inverter by adding a transformer module.
01.07 Connect a delta-primary, wye-secondary arrangement and measure its voltage.
01.08 Connect a half-wave power supply and measure voltages, ripple amplitude and ripple frequency.
01.09 Connect a three-phase, full-wave power supply and measure output voltages with and without filtering.
01.10 Connect a delta-primary, delta-secondary, full-wave power supply and measure output voltages with and without filtering.
01.11 Connect the power supply module for single-phase or three-phase output voltage.
01.12 Connect a step-down transformer to reduce the incoming voltage.

02.0 DEMONSTRATE PROFICIENCY IN POWER DISTRIBUTION SYSTEMS--The student will be able to:

02.01 Connect and verify single-phase and three-phase transformers in WYE to WYE installations.
02.02 Connect and verify single-phase and three-phase transformers in DELTA to DELTA installations.
02.03 Connect and verify single-phase and three-phase transformers in WYE to DELTA installations.
02.04 Connect and verify single-phase and three-phase transformers in DELTA to WYE installations.

03.0 DEMONSTRATE PROFICIENCY IN BASIC CONTROL SYSTEMS--The student will be able to:

03.01 Connect relays and lamp modules in a control system and determine the pull-in and drop-out currents.
03.02 Connect relays and lamp modules in a control system and determine the operating characteristics of solid-state relay.
03.03 Connect a multi-pushbutton control circuit for troubleshooting purposes.
03.04 Connect a test light for STOP and START pushbuttons.
03.05 Connect a test light for a control relay.
03.06 Connect an on-off control station with a pilot light.
03.07 Connect a solid state limit switch and cycle timer.
03.08 Connect a solid state limit switch to a control relay.
03.09 Connect a selector switch to a control circuit.

04.0 DEMONSTRATE PROFICIENCY IN DC MOTORS--The student will be able to:

04.01 Measure the resistances of the two field coils in a DC motor.
04.02 Connect a series type motor.
04.03 Measure the current drawn by the motor and calculate the CEMF generated in the motor for unloaded and loaded conditions.

04.04 Connect a shunt type motor.
04.05 Measure the shunt motor currents and calculate the CEMF.
04.06 Operate a compound motor with separate armature and field supply voltages.
04.07 Operate a compound motor from a single power supply, with and without load, measuring motor current and observing changes in speed.

05.0 DEMONSTRATE PROFICIENCY IN DIGITAL MOTOR CONTROL--The student will be able to:

05.01 Connect a stepping motor to its DC supply.
05.02 Vary the speed and direction of rotation of the stepping motor.
05.03 Program the logic source to make the motor perform in a predictable patter.
05.04 Program the stepping motor for control of rotary or linear displacement.

06.0 DEMONSTRATE PROFICIENCY IN MANUAL CONTROLLERS--The student will be able to:

06.01 Connect a manual starter to operate a three-phase motor.
06.02 Troubleshoot a manual starter.
06.03 Change motor rotation using a drum switch.

07.0 DEMONSTRATE PROFICIENCY IN MAGNETIC CONTROLLERS--The student will be able to:

07.01 Connect a standard start-stop pushbutton station to operate a magnetic motor starter.
07.02 Troubleshoot the control circuit and the power circuit.
07.03 Connect start-stop pushbutton stations to control magnetic starters.
07.04 Connect the STOP pushbutton through a logic relay for NOT, NOR, AND and NAND circuit logic.
07.05 Connect motors arranged for sequence control of a conveyor system.
07.06 Interconnect starters to control a conveyor system so as to prevent pile ups and assure safe operation.
07.07 Connect a motor using a selector switch and a jogging relay.

08.0 DEMONSTRATE PROFICIENCY IN PRESSURE AND STRAIN MEASUREMENTS--The student will be able to:

08.01 Connect a linear Hall sensor.
08.02 Apply amplification to the linear Hall sensor.
08.03 Connect a digital Hall sensor as a hysteresis type of load switch.
08.04 Connect a digital Hall sensor as a sensitive load cell.
08.05 Connect the AC response of the linear variable differential transformer (LVDT) to indicate mechanical position change.

09.0 DEMONSTRATE PROFICIENCY IN TEMPERATURE CONTROL--The student will be able to:

09.01 Connect a temperature module, calibrate the integrated circuit for reading temperature and measure the cold resistance of the thermistor.
09.02 Measure temperature by using a thermocouple mounted on an op-amp module.
09.03 Apply amplified voltage change at the op-amp output to operate a solid-state relay and an indicating device.

09.04 Use an op-amp, relay, lamp and temperature module to set up a system that maintains temperature at a constant level.
09.05 Connect a bridge, temperature module and thyristor module into a closed-loop temperature control system.
09.06 Connect a voltage-controlled oscillator module and determine the range of control voltage necessary for oscillation.
09.07 Connect a temperature and voltage-controlled oscillator module to provide digital readout of temperature.

10.0 DEMONSTRATE PROFICIENCY IN PHOTOELECTRIC CONTROL--The student will be able to:

10.01 Connect a photoconductive cell and incandescent lamp and measure the effect on photocell resistance.
10.02 Use a photo-Darlington transistor to receive light from an incandescent lamp and measure its effect on collector voltage with a change of light intensity.
10.03 Connect a photoelectric relay circuit to turn lights on and off.
10.04 Operate and adjust a fiber optic transmitter for minimum distortion.
10.05 Operate and adjust a fiber optic receiver for maximum sensitivity and minimum distortion.
10.06 Transmit a voice signal from a transmitter to a receiver through an optical cable.
10.07 Transmit digital data through an optical cable.

11.0 DEMONSTRATE PROFICIENCY IN GAS AND HUMIDITY SENSORS--The student will be able to:

11.01 Measure the resistance of a hygropak humidity sensor under varying conditions of humidity.
11.02 Simulate a wet and dry bulb humidity measurement device using a thermistor as the active element.
11.03 Connect a gas detector circuit using a Taguchi gas sensor and measure its cold and hot resistances.
11.04 Use a gas sensor as a smoke detector, coupled with a solid-state relay and lamp, to act as an indicator.

12.0 DEMONSTRATE PROFICIENCY IN LIQUID LEVEL CONTROLS--The student will be able to:

12.01 Connect a level switch to control a pump motor for sump operation.
12.02 Add a timer to a level control circuit to keep the pump motor running for a set time after the level has dropped.
12.03 Add a time to level control circuit to start a second pump motor if the first cannot lower the level after a given time.
12.04 Use the float switch control starter for tank operation.
12.05 Use the pump operating system to provide backspin and surge protection on stopping.

13.0 DEMONSTRATE A PROFICIENCY IN LINE DIAGRAMS AND LOGIC FUNCTIONS--The student will be able to:

13.01 Connect control switches for AND circuit logic.
13.02 Connect control switches for OR circuit logic.
13.03 Connect a control switch for NOT circuit logic.
13.04 Connect switches for NOR circuit logic.
13.05 Connect control switches for NAND circuit logic.
13.06 Connect a logic relay for OR circuit logic.
13.07 Connect a logic relay for AND circuit logic.
13.08 Connect a logic relay for NOR circuit logic.

13.09 Connect a logic relay for NAND circuit logic.
13.10 Connect a control relay in a circuit to add memory to the circuit.
13.11 Connect a logic relay together with a control relay to form a combination of memory with either OR or AND logic.

14.0 DEMONSTRATE PROFICIENCY IN TIMING SYSTEMS--The student will be able to:

14.01 Construct a time delay circuit using an RC network and a silicone controlled rectifier.
14.02 Adjust the time delay relay circuit for different time delays.
14.03 Use a frequency divider as a timing device to obtain different time delays.
14.04 Change the repetition rate of the signal applied to a frequency divider to obtain different time delays.
14.05 Combine the inputs and outputs of two frequency dividers to increase the total division and obtain time delays using a signal having a higher repetition rate.
14.06 Connect a time delay circuit using an integrated circuit and a solid-state relay and measure different time delays.
14.07 Connect a time delay circuit using an operational amplifier to keep a device turned off for a definite period of time.
14.08 Measure the frequency or repetition rate of a sine-wave or square-wave signal.
14.09 Change the function gate time and determine the readout on a digital counter.
14.10 Use the digital counter to measure low frequencies by measuring the period of a waveform or pulse.

15.0 DEMONSTRATE PROFICIENCY IN TIME DELAY CIRCUITS--The student will be able to:

15.01 Connect an on-delay timer to sequence start two motors.
15.02 Connect an on-delay timer to automatically turn off a second motor while the first remains on.
15.03 Connect an off-delay timer to keep a second motor running for a set period of time after the first is turned off.
15.04 Connect an off-delay timer used to prevent a motor from restarting until the time setting is past.
15.05 Connect an off-delay timer for deceleration control.
15.06 Connect a one-shot timer to keep a load turned on for a set period of time regardless of how long the switch-on control is closed.
15.07 Use a one-shot timer to turn on a second motor for a short period of time after the first motor is started.
15.08 Connect a recycle timer into a two-wire control circuit.
15.09 Connect a recycle timer into a three-wire control circuit.

16.0 DEMONSTRATE PROFICIENCY IN PROCESS CONTROL--The student will be able to:

16.01 Explain the operation of a two-position controller and its applications.
16.02 Describe the effects of widening the proportional band.
16.03 Evaluate a proportional circuit based on test data.
16.04 Describe the action of a backup control in a proportional circuit.
16.05 Describe the operation of a direct digital control in an industrial process.

17.0 DEMONSTRATE PROFICIENCY IN TELEMETRY--The student will be able to:

17.01 Connect a telemetry transmitter to a power supply and observe the carrier output waveform with and without modulation.

17.02 Measure the carrier frequency of a telemetry transmitter and observe the effects of modulation on the frequency.

17.03 Measure the input frequency of a telemetry receiver.

17.04 Measure the band-pass of a telemetry receiver.

17.05 Transmit a 200 Hz audio tone between two separate points using a telemetry transmitter and receiver.

17.06 Transmit an analog voltage between two separate points using a telemetry transmitter and receiver.

17.07 Transmit two separate information channels using a single carrier and time-division multiplexing.

18.0 DEMONSTRATE PROFICIENCY IN SYSTEMS INTERFACE--The student will be able to:

18.01 Construct a frequency shift keying (FSK) generator using frequency division.

18.02 Construct an FSK generator using a voltage-to-frequency converter.

18.03 Set up and adjust a phase-locked loop frequency-to-voltage converter.

18.04 Use a frequency-to-voltage converter to demodulate an FSK signal.

18.05 Set up and adjust a charge-pump frequency-to-voltage converter.

18.06 Verify the truth table of a BCD coded switch.

18.07 Verify the analog output voltage of a four-bit digital-to-analog converter.

18.08 Connect an analog-to-digital converter and observe ramp generation and counter operation.

18.09 Calibrate a binary-ramp analog-to-digital converter.

18.10 Generate binary numbers 0000 through 1111 and verify their analog equivalents.

18.11 Interface a four-bit digital signal with a heating element and observe its controlling effect.

18.12 Interface a four-bit digital signal with a light bulb and observe on-off control.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Foremanship and Supervision

CODE NUMBER: Secondary ______ Postsecondary I062001

Florida CIP 0606.200100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: SUPVR TRG @ 7 G IND ENGR @ 7 G
HUMAN REL @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an industrial supervisor (550.132-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, principles of management, planning and cost control, acquisition and retention of manpower, production processes, and quality control and reliability standards.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in those areas that are directly related to the occupational area for which the training is being offered.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply supervision skills.
02. Communicate effectively in supervision.
03. Manage human behavior.
04. Motivate one's self.
05. Motivate others.
06. Apply strategies for effective management.
07. Utilize creative thinking to achieve business objectives.
08. Apply basic decision making skills in supervision.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Foremanship and Supervision POSTSECONDARY NUMBER: I062001

01.0 APPLY SUPERVISION SKILLS--The student will be able to:

01.01 Specify the responsibilities of the supervisor.
01.02 Practice human relations skills.
01.03 Follow leadership principles and approaches.
01.04 Apply positive approaches to discipline.
01.05 Conceptualize organizational functions of management.
01.06 Develop organizational plans.
01.07 Follow and teach accepted accident prevention practices.
01.08 Apply elements of delegation.
01.09 Coordinate employee and organization interest.
01.10 Apply techniques of dealing with crisis.
01.11 Utilize strategies for dealing with interpersonal conflicts.
01.12 Analyze causes of resistance in employees.
01.13 Implement the agreement finding process.
01.14 Develop and implement job instructions.
01.15 Apply delegation procedures.

02.0 COMMUNICATE EFFECTIVELY IN SUPERVISION--The student will be able to:

02.01 Solve problems in communicating.
02.02 Exhibit appropriate habits in person to person communication.
02.03 Apply listening skills.
02.04 Use communication feedback effectively.
02.05 Use persuasion skills in communicating.
02.06 Build credibility in management.
02.07 React to non-verbal communication.
02.08 Practice confrontation skills.

03.0 MANAGE HUMAN BEHAVIOR--The student will be able to:

03.01 Use behavior modification techniques.
03.02 Practice transactional analysis skills.
03.03 Establish goals and objectives.
03.04 Identify and resolve emotional disturbances of workers.
03.05 Use self concept building skills.
03.06 Assess worker and supervisor roles and relationships.
03.07 Manage worker resistance to change.
03.08 Diagnose the dynamics involved in performance appraisal.
03.09 Use appropriate assertiveness skills.

04.0 MOTIVATE ONE'S SELF--The student will be able to:

04.01 Build improved attitude and self-confidence.
04.02 Conceptualize cause and effect relationship.
04.03 Set personal goals.
04.04 Apply self-esteem building skills.
04.05 Diagnose life traps.
04.06 Apply self-discipline techniques.
04.07 Determine areas of personal talent.

05.0 MOTIVATE OTHERS--The student will be able to:

05.01 Conceptualize the self-fulling prophesy.

05.02 Conceptualize the process of motivation.
05.03 Apply the hierarchy of human needs to worker motivation.
05.04 Effect job enrichment procedures.
05.05 Apply attitude enrichment procedures.
05.06 Conceptualize concept of maintainers and motivators.
05.07 Develop role of trust and credibility in worker motivation.
05.08 Direct goal-setting procedures with workers.
05.09 Implement participative style of supervision.

06.0 APPLY STRATEGIES FOR EFFECTIVE MANAGEMENT--The student will be able to:

06.01 Diagnose unacceptable performance.
06.02 Determine effective discipline procedures.
06.03 Undertake disciplinary action.
06.04 Plan appraisal interviews.
06.05 Conduct appraisal interviews.
06.06 Implement transfer, demotion and termination procedures.
06.07 Conduct hiring interviews.
06.08 Implement recruitment procedures.

07.0 UTILIZE CREATIVE THINKING TO ACHIEVE BUSINESS OBJECTIVES--The student will be able to:

07.01 Conduct and apply techniques for maximum production of ideas.
07.02 Maintain conditions necessary for creative problem solving.
07.03 Diagnose conditions antithetical to creativity.
07.04 Oversee problem solving.

08.0 APPLY BASIC DECISION MAKING SKILLS IN SUPERVISION--The student will be able to:

08.01 Conduct decision making meetings.
08.02 Employ steps of effective decision making.
08.03 Maintain conditions for effective decision making.
08.04 Set goals and objectives.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Machinery Maintenance and Repair

CODE NUMBER: Secondary ________ Postsecondary I470303

Florida CIP 0647.030300

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G MILLWRIGHT @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS CONTENT: The purpose of this program is to prepare students for employment as a millwright (85123626), maintenance mechanic (629.280-010), machinery erector (638.261-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to the following, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, metal working skills, welding, basic machine shop functions, troubleshooting techniques, preventative maintenance programs, rigging, equipment installation, and maintenance and repair of a variety of systems found in industrial operations including drive components, piping systems, pumps, hydraulic systems, pneumatic systems, and bearings and seals.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in shop practices, rigging, equipment installation, maintenance, troubleshooting and repair of drive systems, pumps, hydraulic and pneumatic systems as well as basic welding and machine shop skills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read blueprints and schematics.
02. Apply mathematics, physics and metallurgy skills.
03. Utilize and maintain hand tools.
04. Utilize and maintain portable power tools.
05. Perform gas and arc welding procedures.
06. Demonstrate knowledge of basic electricity and electronics.
07. Install and maintain drive components.
08. Perform pump maintenance and repair.
09. Maintain piping and tubing systems.
10. Maintain and repair hydraulic system components.
11. Troubleshoot hydraulic systems.
12. Maintain reciprocating, positive displacement, rotary and dynamic air compressors.
13. Troubleshoot pneumatic systems.
14. Maintain and troubleshoot fluid drive systems.
15. Demonstrate a knowledge of the operation of industrial pollution control systems.
16. Perform rigging functions.
17. Install and remove machinery.
18. Perform machine shop operations.
19. Handle and apply lubricants.
20. Demonstrate appropriate communication skills.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | SECONDARY NUMBER:

PROGRAM TITLE: Industrial Machinery Maintenance and Repair | POSTSECONDARY NUMBER: I470303

01.0 READ BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Explain the purpose of blueprints.
01.02 Examine and interpret machine parts and machine drawings.
01.03 Read and interpret machine assembly drawings.
01.04 Read and interpret building drawings.
01.05 Read and interpret schematics and symbols.
01.06 Read and interpret electrical diagrams.
01.07 Read a piping schematic.
01.08 Identify fluid power system component symbols and interpret diagrams.
01.09 Prepare field sketch of a machine part.

02.0 APPLY MATHEMATICS, PHYSICS AND METALLURGY SKILLS--The student will be able to:

02.01 Add, subtract, multiply and divide positive and negative numbers.
02.02 Add, subtract, multiply and divide fractions.
02.03 Change mixed numbers to decimals and vice versa.
02.04 Develop and interpret ratios.
02.05 Apply entry level geometric functions.
02.06 Solve entry level algebraic equations.
02.07 Apply metric and linear measurement.
02.08 Describe mechanical and chemical properties of ferrous and non-ferrous metals.
02.09 Describe the properties and uses of toxic and flammable materials.

03.0 UTILIZE AND MAINTAIN HAND TOOLS--The student will be able to:

03.01 Demonstrate safe use of hand tools.
03.02 Utilize measuring devices.
03.03 Utilize wrenches and screwdrivers.
03.04 Utilize pipefitting tools.
03.05 Utilize sheetmetal tools.
03.06 Demonstrate the use of ropes, slings, pulleys and block and tackle.

04.0 UTILIZE AND MAINTAIN PORTABLE POWER TOOLS--The student will be able to:

04.01 Demonstrate safe use of portable power tools.
04.02 Utilize and maintain light-duty and heavy-duty drills.
04.03 Utilize and maintain electric hammers.
04.04 Utilize and maintain pneumatic drills and hammers.
04.05 Utilize and maintain power screwdrivers, nut runners.
04.06 Utilize and maintain linear motion saws.
04.07 Utilize and maintain circular saws.
04.08 Utilize and maintain belt, pad and disc sanders.
04.09 Utilize and maintain grinders and shears.

05.0 PERFORM GAS AND ARC WELDING PROCEDURES--The student will be able to:

05.01 Demonstrate safety procedures for performing gas and arc welding.
05.02 Identify components of oxyfuel rig.
05.03 Set up and shut down oxyfuel rig.
05.04 Weld beads in flat position.

05.05 Weld outside corner joint using a filler rod.
05.06 Cut metal of various thicknesses.
05.07 Weld beads in flat position using E-6010 and E-7018 electrodes.
05.08 Weld beads in horizontal and in vertical positions using E-6010 and E-7018 electrodes.
05.09 Weld beads in overhead position using E-6010 and E-7018 electrodes.
05.10 Solder and braze metals.

06.0 DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY AND ELECTRONICS--The student will be able to:

06.01 Define electrical/electronic terms.
06.02 Explain the theory and application of magnetism.
06.03 Explain Ohm's Law.
06.04 Describe DC and AC circuits.
06.05 Disconnect and reconnect electric motors.
06.06 Demonstrate an entry level understanding of electrical control equipment.
06.07 Utilize and maintain ammeters, millimeters, voltmeters, and ohmmeters.

07.0 INSTALL AND MAINTAIN DRIVE COMPONENTS--The student will be able to:

07.01 Demonstrate safety procedures for installing and maintaining drive components.
07.02 Identify types of bearings.
07.03 Remove, inspect and/or replace bearings.
07.04 Remove and replace seals.
07.05 Perform shaft alignment.
07.06 Identify types of belts.
07.07 Identify types of chains.
07.08 Perform tension adjustments on belt and chain drives.
07.09 Troubleshoot belts and chain drives.
07.10 Remove, replace and align couplings.
07.11 Identify types of gears.
07.12 Remove/replace gears.
07.13 Adjust gear backlash.
07.14 Troubleshoot gear drives.
07.15 Disassemble, inspect, reassemble and adjust clutches.
07.16 Identify types of variable speed drives.
07.17 Troubleshoot variable speed drives.
07.18 Identify types of cams and link mechanisms.
07.19 Troubleshoot cam and link mechanism problems.

08.0 PERFORM PUMP MAINTENANCE AND REPAIR--The student will be able to:

08.01 Demonstrate safety procedures for performing pump maintenance.
08.02 Determine pump capacity and system requirements (entry level).
08.03 Perform pump maintenance.
08.04 Identify packing and seal requirements.
08.05 Explain operating principles of centrifugal, propeller and turbine rotary, reciprocating and metering pumps.
08.06 Disassemble and reassemble a pump.

09.0 MAINTAIN PIPING AND TUBING SYSTEMS--The student will be able to:

09.01 Identify components of a piping system.
09.02 Explain maintenance considerations of metallic and non-metallic piping systems.
09.03 Join copper tubing.
09.04 Join common fittings.

09.05 Join metallic pipe.
09.06 Join plastic pipe.
09.07 Explain valve operation and maintenance.
09.08 Explain importance of strainers, filters and traps in piping systems.

10.0 MAINTAIN AND REPAIR HYDRAULIC SYSTEM COMPONENTS--The student will be able to:

10.01 Explain safety procedures for installing hydraulic lines.
10.02 Explain Pascal's Law.
10.03 Explain Bernoulli's Principle.
10.04 Explain how heat and pressure relate to power and transmission.
10.05 Describe physical and chemical properties of a fluid.
10.06 Install and maintain a contaminate removal system.
10.07 Determine reservoir requirements.
10.08 Classify and select pumps for specific applications.
10.09 Compute hose requirements.
10.10 Install hydraulic lines.
10.11 Select and install control valves.

11.0 TROUBLESHOOT HYDRAULIC SYSTEMS--The student will be able to:

11.01 Explain safety procedures for troubleshooting hydraulic systems.
11.02 Read a hydraulic schematic.
11.03 Install hydraulic components.
11.04 Connect electrically controlled valves.
11.05 Explain hydraulic system troubleshooting techniques.
11.06 Repair and replace valves.
11.07 Repair and replace cylinders.
11.08 Repair and replace pumps and motors.
11.09 Cut, flare and bend tubing.

12.0 MAINTAIN RECIPROCATING, POSITIVE DISPLACEMENT, ROTARY AND DYNAMIC AIR COMPRESSORS--The student will be able to:

12.01 Relate force, weight, mass and density to a pneumatic system.
12.02 Explain the operation of reciprocating compressors.
12.03 Explain the operation of positive-displacement rotary compressors.
12.04 Explain primary and secondary air treatment.
12.05 Explain the operation of valves, cylinders and motors.

13.0 TROUBLESHOOT PNEUMATIC SYSTEMS--The student will be able to:

13.01 Explain safety procedures for troubleshooting pneumatic systems.
13.02 Identify common schematic symbols and diagrams.
13.03 Diagram an air supply system.
13.04 Install system components.
13.05 Explain system maintenance techniques.
13.06 Explain proper troubleshooting procedures.
13.07 Troubleshoot air compressors.
13.08 Troubleshoot control valves.
13.09 Troubleshoot, repair and install control valves.
13.10 Troubleshoot air motors.

14.0 MAINTAIN AND TROUBLESHOOT FLUID DRIVE SYSTEMS--The student will be able to:

14.01 Explain safety procedures for maintaining and troubleshooting fluid drive systems.
14.02 Install adjustable speed drives.
14.03 Troubleshoot adjustable speed drives.

14.04 Explain operation of fluid couplings.
14.05 Install fluid couplings.
14.06 Install torque converters.
14.07 Perform preventative maintenance.
14.08 Select adequate substitute bearings when required to restore motor operation.
14.09 Align motor shafts, couplings, pulleys, drive sheaves and guards on both parallel and in-line shafts.
14.10 Apply "dynamic" magnetic/mechanical braking device to a motor.
14.11 Mount equipment.

15.0 DEMONSTRATE A KNOWLEDGE OF THE OPERATION OF INDUSTRIAL POLLUTION CONTROL SYSTEMS--The student will be able to:

15.01 Explain the operation of air pollution control systems.
15.02 Explain the operation of water pollution control systems.
15.03 Explain the operation of solid waste pollution control systems.
15.04 Explain the operation of noise pollution control systems.

16.0 PERFORM RIGGING FUNCTIONS--The student will be able to:

16.01 Demonstrate safety procedures for performing rigging operations.
16.02 Identify and inspect fiber and wire rope.
16.03 Tie knots and hitches.
16.04 Identify and use components of rigging hardware.
16.05 Perform rigging operations.

17.0 INSTALL AND REMOVE MACHINERY--The student will be able to:

17.01 Identify safety procedures for installing and removing machinery.
17.02 Identify equipment required for machine installation/removal.
17.03 Prepare area for machine installation per manufacturer's specifications.
17.04 Rig, lift and transport machinery to installation site.
17.05 Align machinery using wire-line, transit, dial indicators, computer and laser alignment devices.
17.06 Position and secure machinery on foundation.
17.07 Level machinery and install balance vibration dampeners.
17.08 Install electrical hookups to machinery.
17.09 Install air hydraulic hookups to machinery.
17.10 Perform assigned machine retrofit per manufacturer's specifications.
17.11 Perform assigned machine removal and transport per specification requirements.
17.12 Demonstrate proficiency in vibration detection.

18.0 PERFORM MACHINE SHOP OPERATIONS--The student will be able to:

18.01 Demonstrate safety in performing machine shop operations.
18.02 Drill holes using drill press.
18.03 Identify types of cutting tools.
18.04 Bore a hole to a specified size.
18.05 Chase an external V-thread.
18.06 Identify different types of work holding devices.
18.07 Prepare metal for finishing.
18.08 Sharpen drill bit.

19.0 HANDLE AND APPLY LUBRICANTS--The student will be able to:

19.01 Explain the functions of lubrication.
19.02 Explain the properties of oil lubricants and factors determining the selection of lubricants.

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19.03 Identify the types, advantage and functions of lubricant additives.
19.04 Explain the types of circulating oils and their purposes.
19.05 Identify grease application.
19.06 Identify lubricating systems and methods.
19.07 Explain lubricant storage and handling methods.
19.08 Lubricate a piece of industrial equipment.

20.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

20.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
20.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
20.03 Read and follow written and oral instructions.
20.04 Answer and ask questions coherently and concisely.
20.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
20.06 Demonstrate appropriate telephone/communication skills.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents that may be required when applying for a job.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make appropriate job changes.
21.09 Demonstrate acceptable employee health habits.
21.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Maintenance Mechanics

CODE NUMBER: Secondary 8743000 Postsecondary _______

Florida CIP 0647.032300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___7-9 x 9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G
MILLWRIGHT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinery maintenance workers (85128623), general maintenance mechanics. This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: safety and the proper use of tools and equipment, customer service, mathematics, blueprint reading, layout and metal fabrication, welding, electricity, two-stroke, four-stroke, and diesel engine repair, drive components, lubricants, employability skills, and entrepreneurship.

Listed below are the courses that comprise this program when offered at the secondary level:

8743010	Industrial Maintenance Mechanics 1
8743020	Industrial Maintenance Mechanics 2
8743030	Industrial Maintenance Mechanics 3
8743040	Industrial Maintenance Mechanics 4
8743050	Industrial Maintenance Mechanics 5
8743060	Industrial Maintenance Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools, equipment, materials and processes found in the industry. The laboratory activities provide the student opportunities to apply the skills they have learned in each of the outcome areas contained in this program.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Use tools and equipment.
03. Demonstrate proficiency in applying customer service skills.
04. Perform mathematical calculations.
05. Demonstrate ability to read plans and drawings.
06. Perform measuring and layout operations.
07. Describe metals and their properties.
08. Operate metalworking machines.
09. Perform metal fabrication operations.
10. Perform gas welding and cutting operations.
11. Perform electric metal-bonding operations.
12. Perform bench work skills.
13. Demonstrate knowledge of basic electricity and electronics.
14. Demonstrate proficiency in repairing and maintaining basic two-stroke cycle engines.
15. Demonstrate proficiency in repairing and maintaining basic four-stroke cycle engines.
16. Demonstrate proficiency in maintaining and repairing diesel engines.
17. Maintain drive components.
18. Maintain piping and tubing.
19. Troubleshoot hydraulic and pneumatic systems.
20. Handle and apply lubricants.
21. Demonstrate appropriate communication skills.
22. Demonstrate appropriate understanding of basic science.
23. Demonstrate employability skills.
24. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8743000

PROGRAM TITLE: Industrial Maintenance Mechanics POSTSECONDARY NUMBER:

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Practice shop safety rules and procedures.
01.02 Practice personal safety rules and procedures.
01.03 Practice fire safety rules and procedures.
01.04 Practice electrical safety rules and procedures.
01.05 Practice tool safety rules and procedures.
01.06 Maintain a clean work and shop area.

02.0 USE TOOLS AND EQUIPMENT--The student will be able to:

02.01 Use general hand tools.
02.02 Use special hand tools.
02.03 Use precision measuring tools.
02.04 Use power tools.
02.05 Use fasteners.
02.06 Use gaskets and choose sealants.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

03.01 Prepare service orders properly.
03.02 Communicate solutions to customers.
03.03 Follow manufacturers' service manuals.
03.04 Locate parts in a parts catalog or on microfiche.

04.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

04.01 Make job-related decimal and fraction calculations.
04.02 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
04.03 Solve job-related problems using a hand-held calculator.
04.04 Solve job-related problems using basic formulas.
04.05 Solve job-related problems using basic geometry.
04.06 Measure a workpiece and compare measurements with blueprint specifications.
04.07 Solve job-related problems using mathematical handbooks, charts, and tables.
04.08 Convert measurements from English to metric and from metric to English units.

05.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

05.01 Identify dimensions.
05.02 Identify lists of materials and specifications.
05.03 Identify section views detail views.
05.04 Sketch and dimension a part.
05.05 Disassemble and assemble parts using an exploded view drawing.
05.06 Interpret blueprint abbreviations.
05.07 Identify dimensioning of radii, round holes, fillets, and chamfers.
05.08 Identify screw threads and bolt types.
05.09 Apply dimensional tolerances.
05.10 Identify metal fabrication symbols used in blueprints.

06.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

06.01 Perform basic geometric construction.
06.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gages, and circumference rules.
06.03 Develop patterns using parallel line, radial lines, and triangulation.
06.04 Make metal fabrication sketches.
06.05 Read and measure with steel rules.
06.06 Read and measure with micrometers.
06.07 Read and measure with vernier tools.
06.08 Read and measure with dial calipers.
06.09 Read and measure with dial indicators.

07.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

07.01 Describe the steelmaking process.
07.02 Describe the differences between ferrous and nonferrous metals.
07.03 Describe casting, alloys, and forging.
07.04 Identify metals such as galvanized iron and steel, aluminum, stainless steel, sheet metal, copper, and brass.
07.05 Identify properties of the most common metals.
07.06 Identify and describe common gages, shapes, and dimensions of purchased materials.

08.0 OPERATE METALWORKING MACHINES--The student will be able to:

08.01 Identify the purpose of various types of machine shop equipment.
08.02 Operate a drill press utilizing the correct drilling speed.
08.03 Operate a band saw utilizing the correct cutting speed.
08.04 Demonstrate clamping devices for securing stock for drilling.
08.05 Identify types and sizes of drill bits.
08.06 Use portable power saw equipment.
08.07 Use a cutoff or power hacksaw.
08.08 Use electric and air utility grinders.
08.09 Sharpen drill bits.
08.10 Select proper type of abrasive wheels for grinding machines.

09.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

09.01 Fabricate metal, edges, and seams.
09.02 Use hand tools to cut, punch, and shear metal.
09.03 Form sheet metal using a brake, a folder, rolls, and a shear.
09.04 Join metals using solder, rivets, and mechanical fasteners.

10.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

10.01 Identify welding cylinders, regulators, hoses, pressure gages, and torches.
10.02 Describe welding equipment safety procedures.
10.03 Demonstrate proper flame settings.
10.04 Demonstrate basic gas welding skills.
10.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
10.06 Demonstrate freehand and guide cutting of various metal thickness.

11.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

11.01 Describe and demonstrate the spot and arc welding process.
11.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc,

welding in various positions, and clamping.
11.03 Set up and operate a spot welder.
11.04 Explain and demonstrate the MIG welding process.
11.05 Apply basic procedures for safely adjusting, operating, cleaning, and maintaining MIG welding equipment.
11.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips, and choosing filler metal.

12.0 PERFORM BENCH WORK SKILLS--The student will be able to:

12.01 Cut materials by using hand hacksaws.
12.02 Cut threads by using hand taps.
12.03 Cut threads by using dies.
12.04 Repair threads by chasing and thread inserts.
12.05 Ream holes by using hand reamers.
12.06 Hand-sharpen cutting tools by using abrasive stones.
12.07 Hone and lap surfaces.
12.08 Remove damaged screws and other hardware.
12.09 Deburr workpieces.

13.0 DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY AND ELECTRONICS--The student will be able to:

13.01 Define electrical/electronic terms.
13.02 Explain the theory and application of magnetism.
13.03 Explain Ohm's Law.
13.04 Describe DC and AC circuits.
13.05 Demonstrate an entry-level understanding of electrical control equipment.

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

14.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
14.02 Identify types of engines.
14.03 Locate engine serial and model numbers.
14.04 Identify engine assemblies and systems.
14.05 Disassemble engines.
14.06 Remove, clean, and inspect the head for cracks, warpage, and damaged spark plug threads.
14.07 Remove, clean, and inspect piston rods and assemblies.
14.08 Measure out-of-round and cylinder taper.
14.09 Check the total bearing surface of connecting rod bearings.
14.10 Measure piston skirts and ring grooves.
14.11 Measure the piston ring gap in the cylinder bore.
14.12 Accurately fit piston to cylinder.
14.13 Install piston pins according to manufacturer's specification.
14.14 Check rod and piston assembly alignment.
14.15 Install rings on pistons.
14.16 Install piston rod assemblies.
14.17 Check needle bearings.
14.18 Inspect crankshafts and install seals.
14.19 Inspect, clean, and/or replace reed valves.
14.20 Reassemble engines.

15.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

15.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.

15.02 Identify types of four-stroke cycle engines.
15.03 Locate engine serial and model numbers.
15.04 Identify engine assemblies and systems.
15.05 Disassemble engines.
15.06 Clean and inspect heads for cracks, warpage, and damaged spark plug threads.
15.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin.
15.08 Grind valve seats and reface valves.
15.09 Check and inspect springs for free height, distortion, and installed height.
15.10 Adjust valve lash.
15.11 Remove and inspect camshafts and lifters.
15.12 Measure camshafts.
15.13 Service camshaft bearings.
15.14 Clear and inspect lifters for wear.
15.15 Time valve drive assemblies.
15.16 Remove piston from rods assemblies.
15.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
15.18 Check piston pins and bosses for wear.
15.19 Measure piston ring lands width, out-of-round, and taper.
15.20 Measure the piston ring gap in the cylinder bore.
15.21 Install and fit piston pins.
15.22 Check rod and piston assembly alignment.
15.23 Remove and replace rod bearings.
15.24 Hone and clean cylinders.
15.25 Install rings on pistons.
15.26 Measure and check crankshafts with a micrometer.
15.27 Check for end play.
15.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
15.29 Reassemble engines.
15.30 Install oil seals.

16.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES--The student will be able to:

16.01 Identify diesel engine operating principles (two- and four-stroke cycle engines).
16.02 Identify components of two- and four-stroke cycle engines.
16.03 Troubleshoot and repair cooling systems.
16.04 Troubleshoot and repair lubrication systems.
16.05 Troubleshoot and repair induction and exhaust systems.

17.0 MAINTAIN DRIVE COMPONENTS--The student will be able to:

17.01 Demonstrate safety procedures for maintaining drive components.
17.02 Identify types of bearings.
17.03 Remove, inspect, and/or replace bearings.
17.04 Remove and replace seals.
17.05 Perform shaft alignment.
17.06 Identify types of belts.
17.07 Identify types of chains.
17.08 Perform tension adjustments on belt and chain drives.
17.09 Troubleshoot belts and chain drives.

18.0 MAINTAIN PIPING AND TUBING--The student will be able to:

18.01 Identify components of a piping system.
18.02 Explain maintenance considerations of metallic and non-metallic piping system.

18.03 Join copper tubing.
18.04 Join common fittings.
18.05 Join metallic pipe.
18.06 Join plastic pipe.
18.07 Explain valve operation and maintenance.

19.0 TROUBLESHOOT HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

19.01 Explain safety procedures for troubleshooting hydraulic and pneumatic systems.
19.02 Read hydraulic and pneumatic schematics.
19.03 Explain hydraulic and pneumatic troubleshooting techniques.
19.04 Install hydraulic and pneumatic system components.
19.05 Troubleshoot, repair, and install valves.
19.06 Troubleshoot air compressors and hydraulic pumps.

20.0 HANDLE AND APPLY LUBRICANTS--The student will be able to:

20.01 Explain the functions of lubrication.
20.02 Explain the properties of oil lubricants and factors determining the selection of lubricants.
20.03 Identify the types, advantage, and functions of lubricant additives.
20.04 Identify grease application.
20.05 Identify lubricating systems and methods.
20.06 Explain lubricant storage and handling methods.
20.07 Lubricate a piece of industrial equipment.

21.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

21.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
21.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
21.03 Read and follow written and oral instructions.
21.04 Answer and ask questions coherently and concisely.
21.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
21.06 Demonstrate appropriate telephone/communication skills.

22.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

22.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
22.02 Draw conclusions or make inferences from data.
22.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
22.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

23.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

23.01 Conduct a job search.
23.02 Secure information about a job.
23.03 Identify documents which may be required when applying for a job interview.
23.04 Complete a job application form correctly.

23.05 Demonstrate competence in job interview techniques.
23.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, and other employees.
23.07 Identify acceptable work habits.
23.08 Demonstrate knowledge of how to make appropriate job changes.
23.09 Demonstrate acceptable employee health habits.
23.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

24.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

24.01 Define entrepreneurship.
24.02 Describe the importance of entrepreneurship to the American economy.
24.03 List the advantages and disadvantages of business ownership.
24.04 Identify the risks involved in ownership of a business.
24.05 Identify the necessary personal characteristics of a successful entrepreneur.
24.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Maintenance Mechanics

PROGRAM NUMBER: 8743000

COURSE TITLE: Industrial Maintenance Mechanics 1

COURSE NUMBER: 8743010

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Practice shop safety rules and procedures.
01.02 Practice personal safety rules and procedures.
01.03 Practice fire safety rules and procedures.
01.04 Practice electrical safety rules and procedures.
01.05 Practice tool safety rules and procedures.
01.06 Maintain a clean work and shop area.

02.0 USE TOOLS AND EQUIPMENT--The student will be able to:

02.01 Use general hand tools.
02.02 Use special hand tools.
02.03 Use precision measuring tools.
02.04 Use power tools.
02.05 Use fasteners.
02.06 Use gaskets and choose sealants.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

03.01 Prepare service orders properly.
03.02 Communicate solutions to customers.
03.03 Follow manufacturers' service manuals.
03.04 Locate parts in a parts catalog or on microfiche.

04.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

04.01 Make job-related decimal and fraction calculations.
04.02 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
04.03 Solve job-related problems using a hand-held calculator.
04.04 Solve job-related problems using basic formulas.
04.05 Solve job-related problems using basic geometry.
04.06 Measure a workpiece and compare measurements with blueprint specifications.
04.07 Solve job-related problems using mathematical handbooks, charts, and tables.
04.08 Convert measurements from English to metric and from metric to English units.

05.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

05.01 Identify dimensions.
05.02 Identify lists of materials and specifications.
05.03 Identify section views/detail views.
05.04 Sketch and dimension a part.
05.05 Disassemble and assemble parts using an exploded view drawing.
05.06 Interpret blueprint abbreviations.
05.07 Identify dimensioning of radii, round holes, fillets, and

chamfers.
05.08 Identify screw threads and bolt types.
05.09 Apply dimensional tolerances.
05.10 Identify metal fabrication symbols used in blueprints.

06.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

06.01 Perform basic geometric construction.
06.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gages, and circumference rules.
06.03 Develop patterns using parallel line, radial lines, and triangulation.
06.04 Make metal fabrication sketches.
06.05 Read and measure with steel rules.
06.06 Read and measure with micrometers.
06.07 Read and measure with vernier tools.
06.08 Read and measure with dial calipers.
06.09 Read and measure with dial indicators.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Industrial Maintenance Mechanics	PROGRAM NUMBER:	8743000
COURSE TITLE:	Industrial Maintenance Mechanics 2	COURSE NUMBER:	8743020

07.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

07.01 Describe the steelmaking process.
07.02 Describe the differences between ferrous and nonferrous metals.
07.03 Describe casting, alloys, and forging.
07.04 Identify metals such as galvanized iron and steel, aluminum, stainless steel, sheet metal, copper, and brass.
07.05 Identify properties of the most common metals.
07.06 Identify and describe common gages, shapes, and dimensions of purchased materials.

08.0 OPERATE METALWORKING MACHINES--The student will be able to:

08.01 Identify the purpose of various types of machine shop equipment.
08.02 Operate a drill press utilizing the correct drilling speed.
08.03 Operate a band saw utilizing the correct cutting speed.
08.04 Demonstrate clamping devices for securing stock for drilling.
08.05 Identify types and sizes of drill bits.
08.06 Use portable power saw equipment.
08.07 Use a cutoff or power hacksaw.
08.08 Use electric and air utility grinders.
08.09 Sharpen drill bits.
08.10 Select proper type of abrasive wheels for grinding machines.

09.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

09.01 Fabricate metal, edges, and seams.
09.02 Use hand tools to cut, punch, and shear metal.

09.03 Form sheet metal using a brake, a folder, rolls, and a shear.
09.04 Join metals using solder, rivets, and mechanical fasteners.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Industrial Maintenance Mechanics — PROGRAM NUMBER: 8743000

COURSE TITLE: Industrial Maintenance Mechanics 3 — COURSE NUMBER: 8743030

10.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

10.01 Identify welding cylinders, regulators, hoses, pressure gages, and torches.
10.02 Describe welding equipment safety procedures.
10.03 Demonstrate proper flame settings.
10.04 Demonstrate basic gas welding skills.
10.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
10.06 Demonstrate freehand and guide cutting of various metal thickness.

11.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

11.01 Describe and demonstrate the spot and arc welding process.
11.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions, and clamping.
11.03 Set up and operate a spot welder.
11.04 Explain and demonstrate the MIG welding process.
11.05 Apply basic procedures for safely adjusting, operating, cleaning, and maintaining MIG welding equipment.
11.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips, and choosing filler metal.

12.0 PERFORM BENCH WORK SKILLS--The student will be able to:

12.01 Cut materials by using hand hacksaws.
12.02 Cut threads by using hand taps.
12.03 Cut threads by using dies.
12.04 Repair threads by chasing and thread inserts.
12.05 Ream holes by using hand reamers
12.06 Hand-sharpen cutting tools by using abrasive stones.
12.07 Hone and lap surfaces.
12.08 Remove damaged screws and other hardware.
12.09 Deburr workpieces.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Industrial Maintenance Mechanics PROGRAM NUMBER: 8743000

COURSE TITLE: Industrial Maintenance Mechanics 4 COURSE NUMBER: 8743040

13.0 DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY AND ELECTRONICS--The student will be able to:

13.01 Define electrical/electronic terms.
13.02 Explain the theory and application of magnetism.
13.03 Explain Ohm's Law.
13.04 Describe DC and AC circuits.
13.05 Demonstrate an entry-level understanding of electrical control equipment.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Industrial Maintenance Mechanics PROGRAM NUMBER: 8743000

COURSE TITLE: Industrial Maintenance Mechanics 5 COURSE NUMBER: 8743050

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

14.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
14.02 Identify types of engines.
14.03 Locate engine serial and model numbers.
14.04 Identify engine assemblies and systems.
14.05 Disassemble engines.
14.06 Remove, clean, and inspect the head for cracks, warpage, and damaged spark plug threads.
14.07 Remove, clean, and inspect piston rods and assemblies.
14.08 Measure out-of-round and cylinder taper.
14.09 Check the total bearing surface of connecting rod bearings.
14.10 Measure piston skirts and ring grooves.
14.11 Measure the piston ring gap in the cylinder bore.
14.12 Accurately fit piston to cylinder.
14.13 Install piston pins according to manufacturer's specification.
14.14 Check rod and piston assembly alignment.
14.15 Install rings on pistons.
14.16 Install piston rod assemblies.
14.17 Check needle bearings.
14.18 Inspect crankshafts and install seals.
14.19 Inspect, clean, and/or replace reed valves.
14.20 Reassemble engines.

15.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

15.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.
15.02 Identify types of four-stroke cycle engines.
15.03 Locate engine serial and model numbers.
15.04 Identify engine assemblies and systems.
15.05 Disassemble engines.
15.06 Clean and inspect heads for cracks, warpage, and damaged spark plug threads.
15.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin.
15.08 Grind valve seats and reface valves.
15.09 Check and inspect springs for free height, distortion, and installed height.
15.10 Adjust valve lash.
15.11 Remove and inspect camshafts and lifters.
15.12 Measure camshafts.
15.13 Service camshaft bearings.
15.14 Clear and inspect lifters for wear.
15.15 Time valve drive assemblies.
15.16 Remove piston from rods assemblies.
15.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
15.18 Check piston pins and bosses for wear.
15.19 Measure piston ring lands width, out-of-round, and taper.
15.20 Measure the piston ring gap in the cylinder bore.
15.21 Install and fit piston pins.
15.22 Check rod and piston assembly alignment.
15.23 Remove and replace rod bearings.
15.24 Hone and clean cylinders.
15.25 Install rings on pistons.
15.26 Measure and check crankshafts with a micrometer.
15.27 Check for end play.
15.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
15.29 Reassemble engines.
15.30 Install oil seals.

16.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES--The student will be able to:

16.01 Identify diesel engine operating principles (two- and four-stroke cycle engines).
16.02 Identify components of two- and four-stroke cycle engines.
16.03 Troubleshoot and repair cooling systems.
16.04 Troubleshoot and repair lubrication systems.
16.05 Troubleshoot and repair induction and exhaust systems.

17.0 MAINTAIN DRIVE COMPONENTS--The student will be able to:

17.01 Demonstrate safety procedures for maintaining drive components.
17.02 Identify types of bearings.
17.03 Remove, inspect, and/or replace bearings.
17.04 Remove and replace seals.
17.05 Perform shaft alignment.
17.06 Identify types of belts.
17.07 Identify types of chains.
17.08 Perform tension adjustments on belt and chain drives.
17.09 Troubleshoot belts and chain drives.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Industrial Maintenance Mechanics	PROGRAM NUMBER:	8743000
COURSE TITLE:	Industrial Maintenance Mechanics 6	COURSE NUMBER:	8743060

18.0 MAINTAIN PIPING AND TUBING--The student will be able to:

18.01 Identify components of a piping system.
18.02 Explain maintenance considerations of metallic and non-metallic piping system.
18.03 Join copper tubing.
18.04 Join common fittings.
18.05 Join metallic pipe.
18.06 Join plastic pipe.
18.07 Explain valve operation and maintenance.

19.0 TROUBLESHOOT HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

19.01 Explain safety procedures for troubleshooting hydraulic and pneumatic systems.
19.02 Read hydraulic and pneumatic schematics.
19.03 Explain hydraulic and pneumatic troubleshooting techniques.
19.04 Install hydraulic and pneumatic system components.
19.05 Troubleshoot, repair, and install valves.
19.06 Troubleshoot air compressors and hydraulic pumps.

20.0 HANDLE AND APPLY LUBRICANTS--The student will be able to:

20.01 Explain the functions of lubrication.
20.02 Explain the properties of oil lubricants and factors determining the selection of lubricants.
20.03 Identify the types, advantage, and functions of lubricant additives.
20.04 Identify grease application.
20.05 Identify lubricating systems and methods.
20.06 Explain lubricant storage and handling methods.
20.07 Lubricate a piece of industrial equipment.

21.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

21.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
21.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
21.03 Read and follow written and oral instructions.
21.04 Answer and ask questions coherently and concisely.
21.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
21.06 Demonstrate appropriate telephone/communication skills.

22.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

22.01 Understand molecular action as a result of temperature extremes,

chemical reaction, and moisture content.
22.02 Draw conclusions or make inferences from data.
22.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
22.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

23.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

23.01 Conduct a job search.
23.02 Secure information about a job.
23.03 Identify documents which may be required when applying for a job interview.
23.04 Complete a job application form correctly.
23.05 Demonstrate competence in job interview techniques.
23.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, and other employees.
23.07 Identify acceptable work habits.
23.08 Demonstrate knowledge of how to make appropriate job changes.
23.09 Demonstrate acceptable employee health habits.
23.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

24.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

24.01 Define entrepreneurship.
24.02 Describe the importance of entrepreneurship to the American economy.
24.03 List the advantages and disadvantages of business ownership.
24.04 Identify the risks involved in ownership of a business.
24.05 Identify the necessary personal characteristics of a successful entrepreneur.
24.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Management Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0606.200101

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other_______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with an occupational title as industrial manager, or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, principles of management, personnel management, and general business procedures.

II. PROGRAM PARAMETERS: This Associate of Science Degree Program contains at least 15 credit hours of general education, 21 credit hours of management or business related courses and professional electives which may include industrial, technical or related professional courses. The total Associate in Science degree program includes 60 credit hours.

Students enrolling in this program must meet the minimum skills requirements in writing, reading and mathematics as stipulated in State Board of Education Rule 6A-10.315.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

III. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply supervision skills.
02. Communicate effectively in supervision.
03. Manage human behavior.
04. Motivate one's self.
05. Motivate others.
06. Apply strategies for effective management.
07. Utilize creative thinking to achieve business objectives.
08. Apply basic decision making skills in supervision.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

14. Demonstrate knowledge of data processing activities.
15. Identify, classify, and demonstrate management functions.
16. Develop human relations skills.
17. Apply basic quality control principles.
18. Demonstrate an understanding of technical or industrial competencies.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Management Technology — POSTSECONDARY NUMBER: ______

01.0 APPLY SUPERVISION SKILLS--The student will be able to:

01.01 Specify the responsibilities of the supervisor.
01.02 Practice human relations skills.
01.03 Follow leadership principles and approaches.
01.04 Apply positive approaches to discipline.
01.05 Conceptualize organizational functions of management.
01.06 Develop organizational plans.
01.07 Follow and teach accepted accident prevention practices.
01.08 Apply elements of delegation.
01.09 Coordinate employee and organization interest.
01.10 Apply techniques of dealing with crisis.
01.11 Utilize strategies for dealing with interpersonal conflicts.
01.12 Analyze causes of resistance in employees.
01.13 Implement the agreement finding process.
01.14 Develop and implement job instructions.
01.15 Apply delegation procedures.
01.16 Apply principles of management to employee/employer conflicts.

02.0 COMMUNICATE EFFECTIVELY IN SUPERVISION--The student will be able to:

02.01 Solve problems in communicating.
02.02 Exhibit appropriate habits in person to person communication.
02.03 Apply listening skills.
02.04 Use communication feedback effectively.
02.05 Use persuasion skills in communicating.
02.06 Build credibility in management.
02.07 React to non-verbal communication.
02.08 Practice confrontation skills.
02.09 Write an effective memorandum.
02.10 Prepare a written technical report.

03.0 MANAGE HUMAN BEHAVIOR--The student will be able to:

03.01 Use behavior modification techniques.
03.02 Practice transactional analysis skills.
03.03 Establish goals and objectives.
03.04 Identify and resolve emotional disturbances of workers.
03.05 Use self concept building skills.
03.06 Assess worker and supervisor roles and relationships.
03.07 Manage worker resistance to change.
03.08 Diagnose the dynamics involved in performance appraisal.
03.09 Use appropriate assertiveness skills.

04.0 MOTIVATE ONE'S SELF--The student will be able to:

04.01 Build improved attitude and self-confidence.
04.02 Conceptualize cause and effect relationship.
04.03 Set personal goals.
04.04 Apply self-esteem building skills.
04.05 Diagnose life traps.
04.06 Apply self-discipline techniques.
04.07 Determine areas of personal talent.

05.0 MOTIVATE OTHERS--The student will be able to:

05.01 Conceptualize the self-fulling prophesy.
05.02 Conceptualize the process of motivation.
05.03 Apply the hierarchy of human needs to worker motivation.
05.04 Effect job enrichment procedures.
05.05 Apply attitude enrichment procedures.
05.06 Conceptualize concept of maintainers and motivators.
05.07 Develop role of trust and credibility in worker motivation.
05.08 Direct Goal-setting procedures with workers.
05.09 Implement participative style of supervision.

06.0 APPLY STRATEGIES FOR EFFECTIVE MANAGEMENT--The student will be able to:

06.01 Diagnose unacceptable performance.
06.02 Determine effective discipline procedures.
06.03 Undertake disciplinary action.
06.04 Plan appraisal interviews.
06.05 Conduct appraisal interviews.
06.06 Implement transfer, demotion and termination procedures.
06.07 Conduct hiring interviews.
06.08 Implement recruitment procedures.

07.0 UTILIZE CREATIVE THINKING TO ACHIEVE BUSINESS OBJECTIVES--The student will be able to:

07.01 Conduct and apply techniques for maximum production of ideas.
07.02 Maintain conditions necessary for creative problem solving.
07.03 Diagnose conditions antithetical to creativity.
07.04 Oversee problem solving.

08.0 APPLY BASIC DECISION MAKING SKILLS IN SUPERVISION--The student will be able to:

08.01 Conduct decision making meetings.
08.02 Employ steps of effective decision making.
08.03 Maintain conditions for effective decision making.
08.04 Set goals and objectives.
08.05 Evaluate job applicants.
08.06 Select the best ways to discipline an employee.
08.07 Select tasks to delegate.
08.08 Discuss the performance appraisal of an employee with him/her.
08.09 Select the employee to promote.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application for correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge or how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Identify characteristics of the American enterprise system.
13.02 Define inflation and deflation.
13.03 Illustrate the basic economic questions facing any society.
13.04 Determine the results of a change in demand or a change in supply.
13.05 List factors which contribute to economic growth.
13.06 Identify characteristics of different types of business ownership.
13.07 Choose appropriate action in a situation requiring application of business ethics.

14.0 DEMONSTRATE KNOWLEDGE OF DATA PROCESSING ACTIVITIES--The student will be able to:

14.01 Identify terms commonly used in information processing.
14.02 Identify automated business systems, equipment components, and media.
14.03 Sequence and define the six steps of a procession cycle.
14.04 Interpret operations of a flowchart of a simulated business job.
14.05 Check printout for error, correct, and resubmit.
14.06 Use an alphanumeric keyboard and a ten-key numeric pad with appropriate techniques.

15.0 IDENTIFY, CLASSIFY, AND DEMONSTRATE MANAGEMENT FUNCTIONS--The student

will be able to:

15.01 Identify the correct definition of management.
15.02 Identify management positions and styles.
15.03 Identify the major functions of management.
15.04 Classify activities as part of the planning function of management.
15.05 Classify activities as part of the organizing function of management.
15.06 Classify activities as part of the staffing function of management.
15.07 Classify activities as part of the directing function of management.
15.08 Classify activities as part of the controlling function of management.
15.09 Distinguish among management functions.
15.10 Select the most effective communication systems.

16.0 DEVELOP HUMAN RELATIONS SKILLS--The student will be able to:

16.01 Demonstrate appropriate work habits.
16.02 Identify behavior that promotes good human relations.

17.0 APPLY BASIC QUALITY CONTROL PRINCIPLES--The student will be able to:

17.01 Interpret basic statistical process control charts.
17.02 Apply basic statistical process control principles.
17.03 Analyze workers' and inspectors' roles in quality production.
17.04 Conduct a quality circle work session.

18.0 DEMONSTRATE AN UNDERSTANDING OF TECHNICAL OR INDUSTRIAL COMPETENCIES--The student will be able to:

18.01 Demonstrate an understanding of technical or industrial competencies as specified in the curriculum frameworks of any postsecondary adult or postsecondary vocational program.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Plastics

CODE NUMBER: Secondary _______   Postsecondary I480604

Florida CIP 0648.060400

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: IND PLASTI @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as extruding machine operators (91311744), plastic bench mechanics (754.381-018) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, molding and casting plastic parts, patterns, and prototype parts, and fitting, fabricating, assembling, finishing, and repairing of plastic parts and components.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in mold construction parts fabrication, assembly, and finishing: and the processes to produce both component parts and finished plastic products.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must
have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and safe work practices.
02. Read blueprints, schematics, and diagrams.
03. Draw and lay out prototype products.
04. Build molds and patterns.
05. Manufacture component parts.
06. Construct and finish plastic products.
07. Repair plastic products.
08. Use and maintain hand and power tools.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Plastics POSTSECONDARY NUMBER: I480604

01.0 DEMONSTRATE AN UNDERSTANDING OF PROCEDURES AND SAFE WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention, correction and ecological problems and solutions unique to quality control and reliability processes and systems.
01.02 Demonstrate an understanding of physical hazards.
01.03 Demonstrate an understanding of chemical hazards.
01.04 Demonstrate an understanding of biological and biomechanical hazards.
01.05 Demonstrate an awareness and understanding of fire hazards in manufacturing, processing, and fabrication.
01.06 Demonstrate an understanding of the procedures used to control and extinguish NFPA classes of fires.
01.07 Demonstrate an awareness and understanding for the need and use of safety devices, controls, guards and equipment.
01.08 Demonstrate awareness, understanding and use of personal safety protection and devices including but not limited to goggles, safety glasses, masks, helmets, hearing protectors, air respirators, protective clothing, safety shoes and mesh gloves.
01.09 Demonstrate administration of first aid procedures and accident procedures.
01.10 Demonstrate an awareness and understanding of applicable OSHA rules and regulations.

02.0 READ BLUEPRINTS, SCHEMATICS, AND DIAGRAMS--The student will be able to:

02.01 Use working drawings which include detail and assembly drawings.
02.02 Demonstrate the ability to use and interpret information on exterior views, sectional views, auxiliary views, balloon drawings, pictorial drawings, exploded views, perspective drawings and projection drawings.
02.03 Demonstrate the ability to determine accuracy of information on working drawings.
02.04 Demonstrate the ability to perform mathematical calculations utilizing arithmetic, algebra, geometry and trigonometry.
02.05 Demonstrate the ability to read and convert English system and metric system measurements.
02.06 Demonstrate the ability to use decimal metric equivalents charts, tap drill sizes for American standards threads charts drill size decimal equivalent charts, American standard wrench nuts and bolts charts, mechanical fasteners charts and assembly devices charts.
02.07 Demonstrate the ability to use measuring tools and scales.
02.08 Demonstrate the ability to take off materials list from working drawings calculate totals for production.

03.0 DRAW AND LAY OUT PROTOTYPE PRODUCTS--The student will be able to:

03.01 Prepare multi-view drawings.
03.02 Prepare sectional drawings.
03.03 Prepare auxiliary.
03.04 Prepare pictorial drawings.
03.05 Prepare take-off detail drawings.
03.06 Prepare surface developments.

03.07 Prepare a complete set of working drawings including detail and assembly drawings which supply every item of information for the manufacture and assembly of the product represented.

03.08 Prepare a complete set of working drawings manually and using CAD systems. (The CAD systems drawings and program shall be capable of interfacing to drive CADCAM and CAMM manufacturing equipment.)

03.09 Demonstrate necessary design considerations for functional working drawings, i. e. appearance, chemical characteristics, mechanical factors, economics, process of manufacture and design limitations.

04.0 BUILD MOLDS AND PATTERNS--The student will be able to:

04.01 Demonstrate an understanding of requirements to design and apply dies, molds and patterns to the following processes: injection molding, cut extrusions, sheet moldings (vacuum forming and mechanical forming), blow moldings, slush, rotational and dip castings, compression moldings, transfer moldings, reinforced plastics moldings (contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray molding), castings and cold moldings.

04.02 Demonstrate an understanding of appropriate materials and tools used for making dies, molds and patterns dependent upon the plastic material to be processed or manufactured.

04.03 Demonstrate an understanding of processes and machines required to make a die, mold or pattern, i. e. milling, turning, drilling, boring, grinding, hobbing, casting, planing, etching, electroforming, electrical-discharge machining, plating, welding and shaping.

04.04 Design products which can be injection molded.

04.05 Design and construct molds for injection molding of product design above.

04.06 Design products which can be produced by extrusion.

04.07 Design and construct dies to produce various extrusion shapes.

04.08 Design product that can be blow-molded.

04.09 Design and construct molds for products produced using the blow-mold process.

04.10 Design products which are vacuum formed.

04.11 Design patterns and molds to produce products using the vacuum forming process.

04.12 Design products which are pressure formed.

04.13 Design and construct pressure forming molds.

04.14 Design products which are formed by slush, rotational or dip casting.

04.15 Design and construct molds to produce products utilizing slush, rotational and dip casting processes.

04.16 Design products which are compression model.

04.17 Design and construct molds which are used to produce products utilizing the compression molding process.

04.18 Design products which utilize contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray processes.

04.19 Design and construct molds to produce products using contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray molding processes.

05.0 MANUFACTURE COMPONENT PARTS--The student will be able to:

05.01 Demonstrate the ability to select and use molds, patterns, dies, raw materials, measuring and weighing devices, hand tools, fixed equipment, portable equipment and safe procedures to manufacture plastic component parts.

05.02 Manufacture finished plastic parts or products which utilize the following processes: injection molding, extrusion, bow molding, vacuum forming, pressure forming, slush forming, rotational forming, dip casting, compression molding, and contact, vacuum bag, pressure bag, autoclave, matched die, filament wound processes.

06.0 CONSTRUCT AND FINISH PLASTIC PRODUCTS--The student will be able to:

06.01 Demonstrate an understanding of processes, tools, materials and machines necessary to finish and assemble plastic products.
06.02 Demonstrate the ability to finish and assemble plastic products using the following processes: flash removal, slot cutting, polishing, annealing, sawing, filing, drilling, tapping, turning, planing, milling, shaping, routing, sanding, shearing, punching, laser cutting, tumbling, grinding, ashing, buffing, polishing, transparent coating, polishing by solvents, annealing, and post-curing.

07.0 REPAIR PLASTIC PRODUCTS--The student will be able to:

07.01 Demonstrate an understanding of types of repairs which can be performed on various types and classes of plastic products.
07.02 Demonstrate an understanding of types of products which can be used to perform successful repairs.
07.03 Demonstrate an understanding of appropriate tools, machines and processes which can be used to perform successful repairs on plastic products.
07.04 Demonstrate repairs to plastic products using the following processes: cohesive cementing, solvent cementing, mechanical fastening, stapling, snap fit, press fit, heat staking, ultrasonic staking, thermal sealing, impulse sealing ultrasonic sealing, dielectric sealing, hot gas welding, spin welding, hot plate welding, ultrasonic welding, hot blade welding, high pressure lamination.

08.0 USE AND MAINTAIN HAND AND POWER TOOLS--The student will be able to:

08.01 Demonstrate an understanding of care and maintenance of hand tools.
08.02 Demonstrate the safe us of hand tools.
08.03 Demonstrate an understanding of care, adjustment and maintenance of fixed and portable power tools.
08.04 Demonstrate an understanding of care, adjustment, control, and maintenance of production machines.
08.05 Demonstrate the safe use of hand tools, power tools, and production machines to produce products or parts utilizing the processes identified in 05.0, 06.0, and 07.0 above.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Industrial Technology

CODE NUMBER: Secondary ______ Postsecondary I150603

Florida CIP 0615.060300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: IND ENGR @ 7 G

I. MAJOR CONCEPTS CONTENT: The purpose of this program is to prepare students for employment as industrial engineering technicians (22508226), (012.267-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, production and planning, design and installation of integrated systems and measurement, testing, and management of quality control in the manufacturing, transportation, assembly, installation, and operation of processes and products.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the operation of destructive and nondestructive testing equipment, measuring devices, specification reading, and design and measurement for levels of tolerance acceptable with overall specifications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare charts, graphs and diagrams.
02. Conduct time, motion, and cost control studies.
03. Determine estimates for tools, materials and supplies.
04. Sequence operations for fabrication and assembly of products.
05. Discuss manufacturing control procedures.
06. Read and interpret blueprints, schematics, and diagrams.
07. Demonstrate understanding of mechanics, hydraulics and schematics theory.
08. Demonstrate understanding of automated manufacturing processes.
09. Read, interpret, and write technical reports.
10. Demonstrate management skills.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Technology POSTSECONDARY NUMBER: I150603

01.0 PREPARE CHARTS, GRAPHS, AND DIAGRAMS--The student will be able to:

01.01 Gather pertinent information for representation.
01.02 Utilize design tools to draw.
01.03 Evaluate information for description.
01.04 Free sketch draft of diagram.
01.05 Determine most effective means of representation.
01.06 Develop accurate information/representation to scale.

02.0 CONDUCT TIME, MOTION, AND COST CONTROL STUDIES--The student will be able to:

02.01 Develop employee job requirements.
02.02 Analyze time spent on individual tasks.
02.03 Develop cost control data.
02.04 Evaluate production methods.
02.05 Generate specific job requirements.
02.06 Complete job status reports.

03.0 DETERMINE ESTIMATES FOR TOOLS, MATERIALS AND SUPPLIES--The student will be able to:

03.01 Analyze production tooling and materials needs.
03.02 Identify prospective suppliers.
03.03 Obtain bids for purchase.
03.04 Prepare and issue purchase requisition.
03.05 Receive and inspect materials.
03.06 Average distribution of materials based on need.

04.0 SEQUENCE OPERATIONS FOR FABRICATION AND ASSEMBLY OF PRODUCTS--The student will be able to:

04.01 Analyze product components.
04.02 Determine most effective production system.
04.03 Evaluate time requirements at each production step.
04.04 Determine tool, supply, and material needs at each work station.
04.05 Lay out work procedures and stations.

05.0 DISCUSS MANUFACTURING CONTROL PROCEDURES--The student will be able to:

05.01 Evaluate motivation, production, quality and cost in planning efficiency.
05.02 Apply inspection processes in systems.
05.03 Implement quality control procedures.
05.04 Analyze workers and inspectors roles in quality production.
05.05 Plan trial run and production run.

06.0 READ AND INTERPRET BLUEPRINTS, SCHEMATICS, AND DIAGRAMS--The student will be able to:

06.01 Read detailer shop drawings.
06.02 Read assembly drawings.
06.03 Interpret sectional drawings.
06.04 Read and interpret dimensions by tolerance.
06.05 Identify symbols and abbreviations.

07.0 DEMONSTRATE UNDERSTANDING OF MECHANICS, HYDRAULICS AND SCHEMATICS THEORY--The student will be able to:

07.01 Demonstrate an understanding of measuring systems and ratios.
07.02 Locate the center of gravity of a mass.
07.03 Explain working forces of torque, tension, and compression.
07.04 Explain the laws of motion.
07.05 Explain how to calculate work.
07.06 Explain the function of simple machines including levers, inclined plane, wedge wheel and axle, pulley and screw.
07.07 Explain the types of power and the method of producing power including compound gears.
07.08 Calculate volume mathematically and by displacement.
07.09 Explain the laws of friction.
07.10 Identify common schematic symbols and diagrams.
07.11 Diagram an air supply system.
07.12 Install system components.
07.13 Explain system maintenance techniques.
07.14 Explain proper troubleshooting procedures.
07.15 Read a hydraulic schematic.
07.16 Identify hydraulic components.
07.17 Explain hydraulic system troubleshooting techniques.
07.18 Relate force, weight, mass and density to a pneumatic system.
07.19 Explain the operation of reciprocating compressors.
07.20 Explain the operation of positive-displacement rotary compressors.
07.21 Explain primary and secondary air treatment.
07.22 Explain the operation of valves, cylinders, and motors.

08.0 DEMONSTRATE UNDERSTANDING OF AUTOMATED MANUFACTURING PROCESSES--The student will be able to:

08.01 Analyze and evaluate transducers.
08.02 Analyze motor control systems.
08.03 Analyze synchros and resolvers.
08.04 Analyze pulse encoders.
08.05 Analyze farred scales.

09.0 READ, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

09.01 Draw and interpret schematics.
09.02 Record data.
09.03 Write reports.
09.04 Maintain test logs.
09.05 Compose technical letters.

10.0 DEMONSTRATE MANAGEMENT SKILLS--The student will be able to:

10.01 Write and process production orders.
10.02 Select and care for materials.
10.03 Evaluate employee performance.
10.04 Prepare reports and technical data.
10.05 Perform production analysis.
10.06 Evaluate productivity of process.
10.07 Schedule production.
10.08 Perform station inspections.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and

industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Instrument Repair

CODE NUMBER: Secondary ______ Postsecondary I470401

Florida CIP 0647.040100

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___

POSTSECONDARY ADULT
VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other30,31

CERTIFICATION COVERAGE: INSTRMENT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as precision instrument repairers (85905652), instrument mechanics (710.281-026) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintenance and repair of meters, measuring devices, and control devices, dial pressure gauges, electrical controlling, measuring and recording devices, and optical, aeronautical and navigational instruments.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in AC and DC circuit operation, reading and interpretation of blueprints, schematics and diagrams and operation of electrical, thermal, pneumatic and hydraulic test instruments to repair and maintain meters, measuring and control devices.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 8.0, Reading, 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1400 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor circuits.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate proficiency in hydraulic and pneumatic test instruments.
10. Demonstrate proficiency in thermal test instruments.
11. Demonstrate proficiency in meter testing.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Instrument Repair POSTSECONDARY NUMBER: I470401

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power, and energy.
02.06 Apply ohm's law and power formulae.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using VOM and DVM meters and oscilloscopes.
02.09 Compute and measure conductance and resistance of conductors and insulators.
02.10 Apply ohm's law to series circuits.
02.11 Construct and verify operation and series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to parallel circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel parallel-series circuits.
02.17 Construct and verify the operation of series-parallel parallel-series and bridge circuits.
02.18 Troubleshoot series-parallel parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties and circuits and devices.
02.25 Determine and physical and electrical characteristics of capacitors and inductors.
02.26 Define RC and RL time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.

03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter, and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of RLC circuits (series, parallel, and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel, and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot RC, RL, and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor/inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and applications of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors (FET's).
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for sold-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor/inductor analyzers for solid-state

devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze/minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.
06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.

06.13 Construct flip-=flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define, and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR CIRCUITS--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory-device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic/data analyzers for troubleshooting microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment-failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibration procedures.

09.0 DEMONSTRATE PROFICIENCY IN HYDRAULIC AND PNEUMATIC TEST INSTRUMENTS--The student will be able to:

09.01 Select and operate basic hydraulic measuring instruments.

09.02 Select and operate dead weight testers.
09.03 Select and operate manometers.
09.04 Select and operate pressure gauges.
09.05 Select and operate basic pneumatic measuring instruments.
09.06 Select and operate pressure calibrators.
09.07 Select and operate vacuum pumps.
09.08 Select and operate dead weight testers.
09.09 Select and operate manometers.
09.10 Select and operate pressure and vacuum gauges.

10.0 DEMONSTRATE PROFICIENCY IN THERMAL TEST INSTRUMENTS--The student will be able to:

10.01 Select and operate basic thermal measuring instruments.
10.02 Select and operate heat baths.
10.03 Select and operate potentiometers.
10.04 Select and operate thermometers.

11.0 DEMONSTRATE PROFICIENCY IN METER TESTING--The student will be able to:

11.01 Determine meter movement, sensitivity and resistance.
11.02 Extend the current of a meter movement.
11.03 Extend the voltage range of a meter movement.
11.04 Perform condition test of semiconductor diodes using an ohmmeter.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of

mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Instrumentation Engineering Technology

CODE NUMBER: Secondary ______ Postsecondary ______

Florida CIP 0615.040401

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ___Other ___

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as instrumentation engineering technicians, or in related occupations in electronics, or to provide supplemental training to persons currently or previously employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program.

The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry.

In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

The content includes, but is not limited to, DC circuits, AC circuits, solid-state devices, analog circuits, digital circuits and microprocessor systems. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering, laboratory practices and technical recording and reporting.

This specialization content includes but is not limited to calibration of test instruments, thermal, electronic, hydraulic and pneumatic test instruments, design of hydraulic/pneumatic systems, sensors and bench maintenance of communication systems and instruments.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program and provide instruction in electricity and electronic theory, practices and equipment, instrumentation, hydraulics, pneumatics, test apparatus and equipment, calibration and troubleshooting technique.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for a greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills.

The Vocational Industrial Clubs of America, Inc. is an appropriate vocational student organization for providing communications, leadership, human relations and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

Instruction in microcomputer familiarization is appropriate for inclusion in this program.

Algebra and trigonometry are integral parts of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and list of on-the-job and in-school learning experiences: a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in amplitude and frequency modulated transmitters.
02. Demonstrate proficiency in AM and FM receivers.
03. Demonstrate proficiency in AM and FM transceivers, tools and test equipment and troubleshooting procedures.
04. Demonstrate proficiency in electromagnetic wave emissions, wave propagation, antennas and transmission lines.
05. Interpret blueprints, schematics and diagrams.
06. Demonstrate proficiency in use of Electronic Test Instruments.
07. Demonstrate proficiency in use of Hydraulic Test Instruments.
08. Demonstrate proficiency in use of Pneumatic Test Instruments.
09. Demonstrate proficiency in use of Thermal Test Instruments.
10. Demonstrate proficiency in calibration of test instruments.
11. Demonstrate understanding of design and analysis of hydraulic and pneumatic systems.
12. Demonstrate an understanding of theory and function of sensors including: sensors for radiation detection, sensors for rate measurement, sensors for quantity measurement, sensors for physical property measurement, sensors for chemical property measurement, sensors for measuring electrical properties of materials (i.e., resistance and insulation leakage).

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Instrumentation Engineering Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN AMPLITUDE AND FREQUENCY MODULATED TRANSMITTERS -- The student will be able to:

01.01 Define DSB, SSB and PM modulation.
01.02 Analyze and troubleshoot AM and FM RF oscillator circuits.
01.03 Analyze and troubleshoot buffer and multiplier circuits.
01.04 Analyze and troubleshoot RF power amplifier circuits.
01.05 Analyze and troubleshoot AM and FM modulation circuits.
01.06 Analyze and troubleshoot microphone circuits.
01.07 Analyze and troubleshoot balanced modulators and SSB filter circuits.
01.08 Analyze and troubleshoot AM and FM power supply circuits.
01.09 Make power, frequency and modulation measurements of AM and FM transmitters.
01.10 Align and troubleshoot AM and FM transmitters.
01.11 Describe FCC rules pertaining to AM and FM transmitter maintenance and operation.

02.0 DEMONSTRATE PROFICIENCY IN AM AND FM RECEIVERS--The student will be able to:

02.01 Analyze and troubleshoot receiver audio voltage and power amplifiers and speaker/headphone circuits.
02.02 Analyze and troubleshoot AM and FM detector circuits.
02.03 Analyze and troubleshoot AM IF amplifier circuits.
02.04 Analyze and troubleshoot FM IF amplifier and limited circuits.
02.05 Analyze and troubleshoot receiver oscillator and AFC circuits.
02.06 Analyze and troubleshoot RF mixer hetrodyne circuits.
02.07 Analyze and troubleshoot receiver RF amplifier circuits.
02.08 Analyze and troubleshoot AVCAGC circuits.
02.09 Analyze and troubleshoot receiver power supplies.
02.10 Make receiver sensitivity, selectivity, bandwidth, image rejection, and adjacent channel rejection measurements.
02.11 Align and troubleshoot AM and FM receivers.

03.0 DEMONSTRATE PROFICIENCY IN AM AND FM TRANSCEIVERS, TOOLS AND TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES--The student will be able to:

03.01 Analyze and troubleshoot transceiver control, metering and switching circuits.
03.02 Analyze and troubleshoot transceiver frequency synthesizers and phase locked loop circuits.
03.03 Analyze and troubleshoot squelch circuits.
03.04 Align and troubleshoot transceivers.

04.0 DEMONSTRATE PROFICIENCY IN ELECTROMAGNETIC WAVE EMISSIONS, WAVE PROPAGATION, ANTENNAS AND TRANSMISSION LINES--The student will be able to:

04.01 Define the radio frequency spectrum.
04.02 Define types of classification of RF emissions.
04.03 Define the characteristics of radio waves.
04.04 Define radio wave propagation method.
04.05 Define the basic types of antennas.
04.06 Analyze the voltage and current relationships and radiation

patterns for the basic types of antennas.
04.07 Analyze signal strength problems and measure signal strength.
04.08 Analyze problems pertaining to antenna length, propagation velocity and frequency.
04.09 Analyze methods of antenna tuning, gain and directivity.
04.10 Analyze transmission lines in terms of electrical and physical properties.
04.11 Analyze standing waves, cause and effect and measure standing wave ratios.
04.12 Analyze tuned transmission lines and describe applications.
04.13 Draw voltage, current and impedance relationships for tuned transmission lines.
04.14 Analyze transmission line losses.
04.15 Analyze transmission lines.
04.16 Analyze waveguides, resonant cavities and their application.

05.0 INTERPRET BLUEPRINTS, SCHEMATICS AND DIAGRAMS--The student will be able to:

TO BE ANNOUNCED

06.0 DEMONSTRATE PROFICIENCY IN USE OF ELECTRONIC TEST INSTRUMENTS--The student will be able to:

TO BE ANNOUNCED

07.0 DEMONSTRATE PROFICIENCY IN USE OF HYDRAULIC TEST INSTRUMENTS--The student will be able to:

TO BE ANNOUNCED

08.0 DEMONSTRATE PROFICIENCY USE OF PNEUMATIC TEST INSTRUMENTS--The student will be able to:

TO BE ANNOUNCED

09.0 DEMONSTRATE PROFICIENCY IN USE OF THERMAL TEST INSTRUMENTS--The student will be able to:

TO BE ANNOUNCED

10.0 DEMONSTRATE PROFICIENCY IN CALIBRATION OF TEST INSTRUMENTS--The student will be able to:

TO BE ANNOUNCED

11.0 DEMONSTRATE UNDERSTANDING OF DESIGN AND ANALYSIS OF HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

TO BE ANNOUNCED

12.0 DEMONSTRATE AN UNDERSTANDING OF THEORY AND FUNCTION OF SENSORS INCLUDING: SENSORS FOR RADIATION DETECTION, SENSORS FOR RATE MEASUREMENT, SENSORS FOR QUANTITY MEASUREMENT, SENSORS FOR PHYSICAL PROPERTY MEASUREMENT, SENSORS FOR CHEMICAL PROPERTY MEASUREMENT, SENSORS FOR MEASURING ELECTRICAL PROPERTIES OF MATERIALS (I.E., RESISTANCE AND INSULATION LEAKAGE)--The student will be able to:

TO BE ANNOUNCED

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Instrumentation Technology

CODE NUMBER: Secondary _________ Postsecondary I150404

Florida CIP 0615.040400

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: TEC ELEC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as instrumentation technicians, instrument mechanics (710.281-026). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to the following: technical training to support professional personnel in the design, development and evaluation of control and measurement devices, maintaining and repairing various types of meters, measuring devices, and control devices; dial pressure gauges; scales and balances; electrical controlling, measuring and recording devices; and optical, aeronautical and navigational instruments.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in electricity and electronic theory, practices and equipment, instrumentation, hydraulics, pneumatics, test apparatus and equipment, calibration and troubleshooting techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is

recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 600 hours in addition to completion of Electronic Technology or Electronic Engineering Technology.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in instrumentation test instruments.
02. Demonstrate proficiency in electrical system components.
03. Demonstrate proficiency in hydraulic and pneumatic systems.
04. Demonstrate proficiency in repairing instrument systems.
05. Service thermal measuring instruments.
06. Service radiation measuring instruments.
07. Service force measuring instruments.
08. Service rate measuring instruments.
09. Service quantity measuring instruments.
10. Troubleshoot and service physical property measuring instruments.
11. Service chemical property measuring instruments.
12. Troubleshoot and service electrical measuring instruments.
13. Calibrate test instruments.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Instrumentation Technology POSTSECONDARY NUMBER: I150404

01.0 DEMONSTRATE PROFICIENCY IN INSTRUMENTATION TEST INSTRUMENTS--The student will be able to:

01.01 Operate basic hydraulic measuring instruments.
01.02 Operate dead weight testers.
01.03 Operate manometers.
01.04 Operate basic pneumatic measuring instruments.
01.05 Operate vacuum pumps.
01.06 Operate pressure and vacuum gauges.
01.07 Operate basic thermal measuring instruments.
01.08 Operate heat baths.
01.09 Operate potentiometers.
01.10 Operate thermometers.

02.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL SYSTEM COMPONENTS--The student will be able to:

02.01 Identify the basic principles and terminology of process control systems.
02.02 Identify components of process control systems.
02.03 Create block diagrams of simple and complex loops.
02.04 Identify controllers in settings on process control systems.
02.05 Identify and explain electrical principles.
02.06 Identify and explain electrical motors.
02.07 Read and interpret electrical schematic diagrams.
02.08 Install electrical system components.
02.09 Identify and explain procedures for electronic system maintenance.
02.10 Troubleshoot and repair electrical systems using diagnostic techniques.
02.11 Perform operating systems checks and make minor adjustments to electrical systems.
02.12 Identify electrical system interfaces.

03.0 DEMONSTRATE PROFICIENCY IN HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

03.01 Identify principles and practical applications of hydraulic and pneumatic power.
03.02 Identify and define control valves in hydraulic and pneumatic systems.
03.03 Identify pressure and safety relief valves and vacuum breakers.
03.04 Identify cylinders and motors.
03.05 Remove and replace hydraulic and pneumatic components.
03.06 Identify strainers and filters in hydraulic and pneumatic systems.
03.07 Identify reservoirs and accumulators in hydraulic and pneumatic systems.
03.08 Identify hydraulic and pneumatic pumps on a system.
03.09 Identify piping, tubing and fittings on a hydraulic and pneumatic system.
03.10 Identify hydraulic fluids.
03.11 Identify system interfaces.
03.12 Identify practical applications and principles of pneumatic and hydraulic power.
03.14 Identify primary and secondary treatment methods in systems.
03.15 Identify the procedures for pneumatic and hydraulic system

maintenance.
03.16 Perform operating systems checks to pneumatic and hydraulic systems.
03.17 Locate control valve failures.
03.18 Identify safety isolation procedures for removing a device from a system.

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING INSTRUMENT SYSTEMS--The student will be able to:

04.01 Identify automatic control systems functions.
04.02 Identify the elements of process control.
04.03 Identify system transmitters and receivers.
04.04 Identify diagrams symbols and networks.
04.05 Identify parameters of an operational process control system.
04.06 Identify measurement purpose and requirements.
04.07 Identify the elements of measurement systems.
04.08 Identify transducers.
04.09 Identify instrument calibration standard units.
04.10 Analyze systems using troubleshooting flow sheet.
04.11 Identify pressure principles.
04.12 Identify pressure sensors.
04.13 Identify pressure transducers.
04.14 Identify low pressure measurement gauge requirements.
04.15 Install, maintain and service pressure instruments.
04.16 Identify force, stress and strain measurement units.
04.17 Identify weight and mass measuring instruments.
04.18 Identify methods for weighing materials in motion.
04.19 Identify displacement measurement methods.
04.20 Identify acceleration, vibration and shock measurement methods.
04.21 Identify the properties of fluid flow measurement.
04.22 Identify primary measuring devices for fluid flow.
04.23 Identify secondary measuring devices for fluid flow.
04.24 Identify applications for variable area instruments.
04.25 Identify open channel flow devices.
04.26 Identify applications for positive displacement meters.
04.27 Identify applications for turbine flow meters.
04.28 Identify applications for magnetic flow meters.
04.29 Identify applications for ultrasonic flow metering methods.
04.30 Identify solid particle flow metering methods.
04.31 Install, maintain and service flow instruments.
04.32 Identify level measurement instruments.
04.33 Identify pressure head instruments.
04.34 Identify electrical methods for level measurement.
04.35 Identify solid particle level measuring systems.
04.36 Maintain and service level measuring instruments.
04.37 Identify and explain temperature measuring principles and sensors.
04.38 Identify final control elements in process loops.
04.39 Identify electric actuators.
04.40 Identify pneumatic and hydraulic actuators.
04.41 Identify control valves.
04.42 Identify control element applications.
04.43 Identify on-site safety standards and maintenance practices.
04.44 Detail electrical and electronic servicing stations.
04.45 Detail pneumatic and hydraulic servicing stations.
04.46 Detail troubleshooting requirements.
04.47 Identify applications of vacuum measuring methods.

05.0 SERVICE THERMAL MEASURING INSTRUMENTS--The student will be able to:

05.01 Determine temperature measuring instrument and sensor failures.
05.02 Troubleshoot temperature measuring instruments and sensors.

05.03 Remove and replace temperature measuring instrument and sensor components.
05.04 Perform operating systems checks and make adjustments to temperature measuring instruments and sensors.
05.05 Determine calorific value measuring instrument failures.
05.06 Troubleshoot calorific value measuring instrument.
05.07 Remove and replace calorific value measuring instrument components.
05.08 Perform operating systems checks and make minor adjustments to calorific value measuring instruments.
05.09 Identify and explain bimetallic and fluid-filled temperature measuring instruments.
05.10 Identify instruments using electrical methods of measuring temperature.
05.11 Identify pyrometers.
05.12 Install, maintain and service temperature measuring instruments.

06.0 SERVICE RADIATION MEASURING INSTRUMENTS--The student will be able to:

06.01 Troubleshoot and repair radiation measuring instruments.
06.02 Perform operating systems checks and make minor adjustments to radiation measuring instruments.
06.03 Troubleshoot and repair photometric measuring instruments.
06.04 Perform operating systems checks and make minor adjustments to photometric measuring instruments.
06.05 Troubleshoot and repair acoustic measuring instruments.
06.06 Perform operating systems checks and make minor adjustments to acoustic measuring instruments.

07.0 SERVICE FORCE MEASURING INSTRUMENTS--The student will be able to:

07.01 Troubleshoot and repair moment (torque) measuring instruments.
07.02 Perform operating systems checks and make adjustments to moment (torque) measuring instruments.
07.03 Troubleshoot and repair force per unit area measuring instruments.
07.04 Perform operating systems checks and make adjustments to force per unit area measuring instruments.

08.0 SERVICE RATE MEASURING INSTRUMENTS--The student will be able to:

08.01 Troubleshoot and repair flow measuring instrument failures.
08.02 Perform operating system checks and make minor adjustments to flow measuring instruments.
08.03 Troubleshoot and repair velocity measuring instruments.
08.04 Perform operating systems checks and make minor adjustments to velocity measuring instruments.
08.05 Troubleshoot and repair acceleration measuring instruments.
08.06 Perform operating systems checks and make minor adjustments to weight measuring instruments.

09.0 SERVICE QUANTITY MEASURING INSTRUMENTS--The student will be able to:

09.01 Troubleshoot and repair mass measuring instrument failures.
09.02 Perform operating systems checks and make minor adjustments to mass measuring instruments.
09.03 Troubleshoot and repair weight measuring instruments.
09.04 Perform operating systems checks and make minor adjustments to weight measuring instruments.
09.05 Identify characteristics of strain gauge measurement components and techniques.
09.06 Install, maintain and service strain gauge instruments.

10.0 TROUBLESHOOT AND SERVICE PHYSICAL PROPERTY MEASURING INSTRUMENTS--The student will be able to:

10.01 Troubleshoot and repair density and specific gravity measuring instruments.
10.02 Perform operating systems checks and make adjustments to density and specific gravity measuring instruments.
10.03 Troubleshoot and repair humidity measuring instruments.
10.04 Perform operating systems checks and make adjustments to humidity measuring instruments.
10.05 Troubleshoot and repair moisture content measuring instruments.
10.06 Perform operating systems checks and make minor adjustments to moisture content measuring instruments.
10.07 Troubleshoot and repair viscosity measuring instruments.
10.08 Perform operating systems checks and make minor adjustments to viscosity measuring instruments.
10.09 Troubleshoot and repair consistency measuring instruments.
10.10 Perform operating systems check and make minor adjustments to consistency measuring instruments.

11.0 SERVICE CHEMICAL PROPERTY MEASURING INSTRUMENTS--The student will be able to:

11.01 Troubleshoot and repair analytical measuring instruments.
11.02 Perform operating systems checks and make minor adjustments to analytical measuring instruments.
11.03 Troubleshoot and repair Ph measuring instruments.
11.04 Perform operating systems checks and make minor adjustments to Ph measuring instruments.
11.05 Troubleshoot and repair liquid conductivity measuring instruments.
11.06 Perform operating systems checks and make adjustments to liquid conductivity measuring instruments.
11.07 Troubleshoot and repair chromatograph measuring instruments.
11.08 Perform operating systems checks and make minor adjustments to chromatograph measuring instruments.
11.09 Troubleshoot and repair mass spectrometer measuring instruments.
11.10 Perform operating systems checks and make adjustments to mass spectrometer measuring instruments.
11.11 Troubleshoot and repair gas analyzer measuring instruments.
11.12 Perform operating systems checks and make minor adjustments to gas analyzer measuring instruments.

12.0 TROUBLESHOOT AND SERVICE ELECTRICAL MEASURING INSTRUMENTS--The student will be able to:

12.01 Troubleshoot and repair electromotive force measuring instruments.
12.02 Perform operating systems checks and make adjustments to electromotive force measuring instruments.
12.03 Troubleshoot and repair electric current measuring instruments.
12.04 Perform operating systems checks and make adjustments to electric current measuring instruments.
12.05 Troubleshoot and repair resistance measuring instruments.
12.06 Perform operating systems checks and make minor adjustments to resistance measuring instruments.
12.07 Troubleshoot and repair conductance measuring instruments.
12.08 Perform operating systems checks and make minor adjustments to conductance measuring instruments.
12.09 Troubleshoot and repair inductance measuring instruments.
12.10 Perform operating systems checks and make minor adjustments to inductance measuring instruments.
12.11 Troubleshoot and repair capacitance measuring instruments.
12.12 Perform operating systems checks and make minor adjustments to

capacitive measure instruments.
12.13 Troubleshoot and repair impedance measuring instruments.
12.14 Perform operating systems checks and make minor adjustments to impedance measuring instruments.

13.0 CALIBRATE TEST INSTRUMENTS--The student will be able to:

13.01 Calibrate volt-OHM milliammeters (VOM).
13.02 Calibrate electronic voltmeters (EVM).
13.03 Calibrate transistor testers.
13.04 Calibrate resistor substitution boxes.
13.05 Calibrate oscilloscopes.
13.06 Calibrate function generators.
13.07 Calibrate frequency meters.
13.08 Calibrate power supply voltage.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.

17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Identify characteristics of the American enterprise system.
18.02 Define inflation and deflation.
18.03 Illustrate the basic economic questions facing any society.
18.04 Determine the results of a change in demand or a change in supply.
18.05 List factors which contribute to economic growth.
18.06 Identify characteristics of different types of business ownership.
18.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Insulation Installation

CODE NUMBER: Secondary _______ Postsecondary I460407

Florida CIP 0646.040700

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G INSULAT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an insulation worker (87802553), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of personal protection equipment, ladders and scaffolds, and the fabrication and installation of insulating materials.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in erection of scaffolds and ladders, occupational health concerns and use of personal protection equipment, and installation of insulating materials in new and existing structures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of general applications and uses of insulation.
02. Apply insulation theory to job needs.
03. Explain and demonstrate appropriate field safety rules and procedures.
04. Read and interpret blueprints and specifications.
05. Describe the application and apply various insulation materials.
06. Demonstrate the use of accessory materials for insulation.
07. Perform specialized insulation activities.
08. Perform measurement of materials for job site.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Insulation Installation POSTSECONDARY NUMBER: I460407

01.0 DEMONSTRATE KNOWLEDGE OF GENERAL APPLICATIONS AND USES OF INSULATION--The student will be able to:

01.01 Describe uses of insulation.
01.02 Identify insulation bonding agents such as tapes and cements.
01.03 Describe insulation needs of mechanical systems on buildings such as heating and air conditioning units.
01.04 Describe insulation needs of plumbing and pipes.

02.0 APPLY INSULATION THEORY TO JOB NEEDS--The student will be able to:

02.01 State the concept of heat transfer.
02.02 Describe methods of heat transfer.
02.03 Identify factors of insulation.
02.04 Analyze moisture effects on insulation material.
02.05 State the cause of vapor.
02.06 Identify different vapor barriers.

03.0 EXPLAIN AND DEMONSTRATE APPROPRIATE FIELD SAFETY RULES AND PROCEDURES--The student will be able to:

03.01 Utilize appropriate protective clothing.
03.02 Apply first-aid procedures as needed.
03.03 Set up warning signs, signals, and barricades,
03.04 Operate tools safety.
03.05 Place ladders and scaffolding appropriately.
03.06 Store materials safely and securely.

04.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

04.01 Read and interpret job specifications.
04.02 Analyze plot plan.
04.03 Verify plan view.
04.04 Determine proper elevation section.
04.05 Read and interpret isometric drawing.
04.06 Interpret blueprint based on various scale.
04.07 Identify column lines.
04.08 Define blueprint symbols.

05.0 DESCRIBE THE APPLICATION AND APPLY VARIOUS INSULATION MATERIALS--The student will be able to:

05.01 Describe the uses of fiberglass.
05.02 Describe the uses of mineral wool.
05.03 Describe the uses of cellular glass.
05.04 Describe the uses of polyurethane (rigid).
05.05 Describe the uses of polystyrene (expanded and extended).
05.06 Describe the uses of cabular foam (flexible).
05.07 Describe the uses of calcium silicate.
05.08 Describe the uses of expanded perlite.
05.09 Describe the uses of ceramic fibers.
05.10 Install pipe coverings.
05.11 Install wall insulations.
05.12 Install insulation to mechanical systems such as block boilers, tanks, flues, and environmental units.

05.13 Describe multi-layer applications.
05.14 Install board and block materials.
05.15 Apply blanket dust wrap.
05.16 Apply sprayed, formed, and foam insulations.
05.17 Cut materials using appropriate tools.

06.0 DEMONSTRATE THE USE OF ACCESSORY MATERIALS FOR INSULATION--The student will be able to:

06.01 Apply various adhesives.
06.02 Utilize cement bondings as needed.
06.03 Install fasteners and clips.
06.04 Apply reinforcement materials.
06.05 Install mastics for vapor proofing as needed.
06.06 Utilize pipe jackets.
06.07 Describe function and use of weather barriers.

07.0 PERFORM SPECIALIZED INSULATION ACTIVITIES--The student will be able to:

07.01 Apply and describe uses of insulated panels.
07.02 Describe the uses of cryogenic insulation.
07.03 Identify and install fire protection.
07.04 Describe the uses of acoustical insulations.
07.05 Describe the uses of temperature refractory insulation.

08.0 PERFORM MEASUREMENT OF MATERIALS FOR JOB SITE--The student will be able to:

08.01 Estimate amount of materials needed.
08.02 Order appropriate insulations for job site.
08.03 Calculate exact measurements for insulation.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Jewelry Manufacturing and Repair
CODE NUMBER: Secondary ______ Postsecondary I480602
Florida CIP 0648.060200

SECONDARY SCHOOL CREDITS ______ CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: METAL WORK @ 7 G JWLY MFGR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as jewelers and silversmiths (89123675), jewelers (700.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, fabrication and repair of jewelry articles as rings, brooches, pendants, bracelets, and lockets, form models and molds, set stones, cast jewelry, cut, file, and polish articles using hand tools and polishing wheels, and reshape and restyle old jewelry.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in all phases of jewelry manufacturing and repair including design, construction, and molding jewelry articles.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1300 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Develop basic trade skills.
02. Roll metal and wire.
03. Perform sawing, piercing, filing and cutting skills.
04. Solder jewelry.
05. Design and fabricate jewelry.
06. Cast jewelry.
07. Set stones.
08. Repair jewelry.
09. Apply surface treatment.
10. Finish jewelry.
11. Perform basic shop management skills.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Jewelry Manufacturing and Repair POSTSECONDARY NUMBER: I480602

01.0 DEVELOP BASIC TRADE SKILLS--The student will be able to:

01.01 Identify safety skills.
01.02 Develop basic math, measuring and weighing skills.
01.03 Test and identify metals.
01.04 Test and identify stones.
01.05 Select and use hand tools and equipment.

02.0 ROLL METAL AND WIRE--The student will be able to:

02.01 Melt precious metals into ingots.
02.02 Roll ingot into sheet metalwire.
02.03 Construct a tubing wire.

03.0 PERFORM SAWING, PIERCING, FILING AND CUTTING SKILLS--The student will be able to:

03.01 Use sawing techniques.
03.02 Use piercing techniques.
03.03 Use filing techniques.
03.04 Use cutting techniques.

04.0 SOLDER JEWELRY--The student will be able to:

04.01 Select torch equipment and hand tools.
04.02 Select appropriate solder and flux.
04.03 Solder jewelry.

05.0 DESIGN AND FABRICATE JEWELRY--The student will be able to:

05.01 Design and fabricate jewelry using wire.
05.02 Design and fabricate jewelry using jewelry metals.
05.03 Design and fabricate jewelry using surface treatments.

06.0 CAST JEWELRY--The student will be able to:

06.01 Identify types of casting methods.
06.02 Design and sculpture wax models and molds.
06.03 Cast jewelry pieces using lost wax process.

07.0 SET STONES--The student will be able to:

07.01 Set stone in a pronged mounting.
07.02 Set stone in a bezel setting.
07.03 Set stone in a baguette setting.
07.04 Set stone in a pave setting.
07.05 Set stone in a peg setting.
07.06 Set stone in a tube setting.
07.07 Set stone in a channel setting.

08.0 REPAIR JEWELRY--The student will be able to:

08.01 Repair chain.
08.02 Size ring.

08.03 Reshank ring.
08.04 Repair or replace findings.
08.05 Repair prong.
08.06 Repair hinge.

09.0 APPLY SURFACE TREATMENT--The student will be able to:

09.01 Identify surface techniques.
09.02 Electroplate jewelry.
09.03 Etch jewelry.
09.04 Enamel metal.
09.05 Apply repousse' and chasing techniques.
09.06 Apply engraving techniques.

10.0 FINISH JEWELRY--The student will be able to:

10.01 Buff jewelry using abrasives.
10.02 Polish jewelry.
10.03 Clean jewelry.

11.0 PERFORM BASIC SHOP MANAGEMENT SKILLS--The student will be able to:

11.01 Apply customer relations skill.
11.02 Prepare cost estimates and work orders.
11.03 Maintain a shop production schedule.
11.04 Maintain inventory.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the

proper precautions required for handling such materials.

14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Land Surveying

CODE NUMBER: Secondary ______   Postsecondary ______

Florida CIP 0615.020301

SECONDARY SCHOOL CREDITS ____   COLLEGE CREDITS x   POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVEL(S): ____7-9   ____9-12   ____Postsecondary Adult Vocational

x Postsecondary Vocational   _____ Other

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a surveying manager, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, recordkeeping skills and mathematics, and use of surveying equipment to perform measurement activities.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in chaining, rod and level activities, angle measurement, electronic distance measurement, land surveying and construction layout.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The specialized content includes but is not limited to surveying techniques, sketching and drawing, engineering measurement, and drafting skills.

As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for a greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Measure land using chains and tape.
02. Perform rod and level activities.
03. Perform angle measurement activities.
04. Perform electronic distance measurement activities.
05. Perform land surveying activities.
06. Perform construction stake out activities.
07. Perform supervisory functions.
08. Determine methods and procedures for establishing survey control.
09. Develop sketches and drawings.
10. Research previous survey evidence
11. Compute volumes and areas.
12. Read, interpret, and write descriptions of land.
13. Prepare charts and tables.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　　SECONDARY NUMBER: ________

PROGRAM TITLE: Land Surveying　　POSTSECONDARY NUMBER: ________

01.0 MEASURE LAND USING CHAINS AND TAPE--The student will be able to:

01.01 Clear brush to establish line of sight.
01.02 Hold the chain/tape over a point.
01.03 Pull the chain/tape.
01.04 Wind the chain/tape on reel.
01.05 Set the marker.
01.06 Loop and throw the unreeled chain/tape.
01.07 Establish a line perpendicular to an existing line at a given point using a right angle prism.
01.08 Establish elevation using a hand (Locke) level.
01.09 Test and standardize the chain/tape.

02.0 PERFORM ROD AND LEVEL ACTIVITIES--The student will be able to:

02.01 Plumb the rod.
02.02 Obtain a rod reading using a target.
02.03 Obtain a rod reading with using a target.
02.04 Establish a turning point benchmark.
02.05 Set up the level.
02.06 Test the level.

03.0 PERFORM ANGLE MEASUREMENT ACTIVITIES--The student will be able to:

03.01 Set up a transit theodolite over a point.
03.02 Measure a horizontal angle.
03.03 Measure a vertical angle.
03.04 Lay out a horizontal angle.
03.05 Lay out a vertical angle.
03.06 Read a compass bearing.
03.07 Adjust transit theodolite leveling bubbles.
03.08 Adjust transit theodolite vertical cross-hair by double centering.
03.09 Adjust transit theodolite vertical cross-hair for vertical accuracy.

04.0 PERFORM ELECTRONIC DISTANCE MEASUREMENT ACTIVITIES--The student will be able to:

04.01 Test accuracy of instrument against a known point.
04.02 Set up EDM.
04.03 Obtain scope distance and compute horizontal distance.
04.04 Set up reflector.

05.0 PERFORM LAND SURVEYING ACTIVITIES--The student will be able to:

05.01 Determine horizontal distance by the stadia method.
05.02 Determine elevation by the stadia method.
05.03 Locate detail by angle and distance using a transit theodolite.
05.04 Locate detail by the use of a plane table and a lidade.
05.05 Establish property corners from deed descriptions or plat.
05.06 Secure a deed from the courthouse.

06.0 PERFORM CONSTRUCTION STAKE OUT ACTIVITIES--The student will be able to:

06.01 Establish horizontal control.

06.02 Establish vertical control.
06.03 Stake out horizontal curves.
06.04 Determine elevations for vertical curves.
06.05 Establish slope stakes.

07.0 PERFORM SUPERVISORY FUNCTIONS--The student will be able to:

07.01 Demonstrate equipment use.
07.02 Inventory field supplies and equipment.
07.03 Select equipment.
07.04 Evaluate personnel
07.05 Schedule work.
07.06 Perform mathematical checks on field work.
07.07 Keep field notes.

08.0 DETERMINE METHODS AND PROCEDURES FOR ESTABLISHING SURVEY CONTROL--The student will be able to:

08.01 Understand and apply methods of distance measurements.
08.02 Understand and apply methods of angle measurements.
08.03 Understand and apply azimuth determination.
08.04 Understand and apply closure computations.
08.05 Understand and apply adjustment of data.

09.0 DEVELOP SKETCHES AND DRAWINGS--The student will be able to:

09.01 Make lettering sketches to identify items.
09.02 Demonstrate inking procedures.
09.03 Identify map symbolism.
09.04 Define and interpret dimensioning.
09.05 Write a brief but adequate property description.

10.0 RESEARCH PREVIOUS SURVEY EVIDENCE--The student will be able to:

10.01 Be familiar with courthouse procedures.
10.02 Conduct a title search.
10.03 Demonstrate an understanding of deeds.
10.04 Search for record evidence.
10.05 Demonstrate proper resurvey processes.

11.0 COMPUTE VOLUMES AND AREAS--The student will be able to:

11.01 Compute an area by using trapezoids
11.02 Compute an area by using coordinates.
11.03 Compute an area of a curved surface.
11.04 Compute volumes of linear dimension surfaces.
11.05 Compute volumes of curved surfaces.

12.0 READ, INTERPRET, AND WRITE DESCRIPTIONS OF LAND--The student will be able to:

12.01 Prepare metes-and-bounds descriptions.
12.02 Understand the U.S. Public Land Survey System.
12.03 Understand and interpret sectionalized surveys.
12.04 Understand and interpret sectional breakdowns.
12.05 Understand and interpret standard deed information.

13.0 PREPARE CHARTS AND TABLES--The student will be able to:

13.01 Understand and prepare curve information.
13.02 Understand and prepare highway design information.
13.03 Understand and prepare standard control information.

13.04 Understand and prepare proper field notes.
13.05 Understand and prepare proper legend information.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.

18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Laser Electro-Optic Engineering Technology

CODE NUMBER: Secondary ________ Postsecondary ________

Florida CIP 0615.030401

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: This program is designed to prepare students for employment as laser engineering technicians or in related occupations in electronics, or to provide supplemental training for persons previously or currently employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program. The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

This specialization content includes, but is not limited to, assembly, installation, operation, maintenance, troubleshooting and repairing of laser electro-optic equipment. This program contains content related to the design, theory, and analysis of laser systems and applications. The specialized content also includes optical systems and elements, laser applications, laser energy, laser optical measurements, assembly of laser components, gas lasers, and solid state lasers.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing electronic circuitry.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills. The computational skills should include algebra and trigonometry.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for

each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency, identification and use of lasers.
02. Demonstrate and practice the use of optical elements.
03. Demonstrate and analyze wave optical systems.
04. Perform laser technology applications.
05. Calibrate, troubleshoot, and analyze laser peripheral components.
06. Demonstrate and practice laser energy applications.
07. Analyze, construct and demonstrate laser optical measurements.
08. Demonstrate proficiency in analysis and evaluation of wave optical systems.
09. Demonstrate proficiency in analysis, assembly of laser components, and test beam characteristics.
10. Demonstrate proficiency in optical systems, making use of wave characteristics of light.
11. Demonstrate proficiency in operating output beam characteristics of various gas lasers.
12. Demonstrate proficiency in solid-state lasers in various operational modes.
13. Demonstrate proficiency in laser systems designs appropriate to assigned applications.
14. Demonstrate proficiency planning and documenting a laser-oriented project.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　SECONDARY NUMBER:

PROGRAM TITLE: Laser Electro-Optic Engineering Technology　　POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY, IDENTIFICATION AND USE OF LASERS--The student will be able to:

01.01 Identify and apply laser safety practices.
01.02 Define and identify the elements and operation of a laser.
01.03 Operate a power meter.
01.04 Demonstrate proper cleaning techniques for optical material.
01.05 Identify and utilize component supports.
01.06 Analyze the use of filters and beam-splitters.
01.07 Define and analyze the properties of light.
01.08 Measure and analyze the emission and absorption of light.
01.09 Define and analyze lasing action.
01.10 Identify, analyze and define optical cavities and modes of oscillation.

02.0 DEMONSTRATE AND PRACTICE THE USE OF OPTICAL ELEMENTS--The student will be able to:

02.01 Describe and analyze temporal characteristics.
02.02 Describe and analyze spatial characteristics.
02.03 Define and analyze the characteristics of a gas laser.
02.04 Define laser classifications and characteristics.
02.05 Define reflection and refraction.
02.06 Apply principles of reflection graphically and experimentally.
02.07 Apply principles of refraction graphically and experimentally.
02.08 Apply principles of imaging with a single lens graphically and experimentally.
02.09 Apply principles of imaging with a multiple lens graphically and experimentally.
02.10 Apply principles of the effect of F-stop and apertures graphically and experimentally.

03.0 DEMONSTRATE AND ANALYZE WAVE OPTICAL SYSTEMS--The student will be able to:

03.01 Identify and analyze light sources and their characteristics.
03.02 Define and describe the quantities of radiometric and photometric in the radiation of energy/power.
03.03 Describe and define the wave nature of light.
03.04 Analyze reflection and refraction using the principles of the wave nature of light.
03.05 Identify and apply the effects of propagation of light.
03.06 Demonstrate the interference light.
03.07 Define and apply the principles of the diffraction of light.
03.08 Demonstrate the polarization of light.
03.09 Operate polarizers.
03.10 Define and analyze the coupling of light into fiber optics.
03.11 Analyze the propagation of light in fiber optics.
03.12 Describe the construction of optical fibers.
03.13 Identify and describe the losses in fiber optics.
03.14 Identify the advantages and disadvantages of fiber optics.

04.0 PERFORM LASER TECHNOLOGY APPLICATIONS--The student will be able to:

04.01 Define and apply nondestructive testing techniques.

04.02 Define and apply range finding.
04.03 Define and apply alignment and angle testing.
04.04 Construct four types of interferometers.
04.05 Construct and use a holography system.

05.0 CALIBRATE, TROUBLESHOOT, AND ANALYZE LASER PERIPHERAL COMPONENTS--The student will be able to:

05.01 List the properties of different types of optical materials.
05.02 Define and demonstrate the limitations of optical materials.
05.03 Define and demonstrate windows and flats.
05.04 Define and demonstrate mirrors and etalons.
05.05 Apply and analyze prisms.
05.06 Apply and analyze the use of lenses.
05.07 Apply and analyze the use of gratings.
05.08 Apply and define nonlinear materials.
05.09 Apply beam expanders and spatial filters.

06.0 DEMONSTRATE AND PRACTICE LASER ENERGY APPLICATIONS--The student will be able to:

06.01 Apply and define laser safety, hazards and evaluation.
06.02 Troubleshoot and analyze pulsed laser flashlamps and power supplies.
06.03 Troubleshoot and use power sources for CW lasers.
06.04 Define and analyze the use of CW solid lasers-efficiency and cooling.
06.05 Measure and record laser power and energy.
06.06 Apply laser beam divergence and focusing.
06.07 Troubleshoot and define optically pumped pulsed solid lasers.
06.08 Troubleshoot and define laser Q-switching.
06.09 Apply and define semiconductor lasers.

07.0 ANALYZE, CONSTRUCT AND DEMONSTRATE LASER OPTICAL MEASUREMENTS--The student will be able to:

07.01 Operate and analyze electro-optic devices.
07.02 Operate and analyze acousto-optic devices.
07.03 Define mode-locking.

08.0 DEMONSTRATE PROFICIENCY IN ANALYSIS AND EVALUATION OF WAVE OPTICAL SYSTEMS--The student will be able to:

08.01 Measure the imaging properties of single lenses.
08.02 Measure the magnification of multiple lens systems.
08.03 Adjust the telescope for collimation.
08.04 Measure and correct lens system for minimum aberration.
08.05 Measure the effect of F-stops and apertures.
08.06 Measure the properties of gratings.
08.07 Describe the fundamental characteristics of image erection systems.
08.08 Apply the matrix method of ray tracing through optical systems.
08.09 Analyze the effective use of filters and beam splitters.
08.10 Test the stability of optical mounting methods.
08.11 Measure light intensity in photometric units.

09.0 DEMONSTRATE PROFICIENCY IN ANALYSIS, ASSEMBLY OF LASER COMPONENTS, AND TEST BEAM CHARACTERISTICS--The student will be able to:

09.01 Identify and analyze light sources and their characteristics.
09.02 Define and describe the quantities of radiometric and photometric in the radiation of energy/power.

09.03 Describe and define the wave nature of light.
09.04 Demonstrate the effects of reflection and refraction.
09.05 Demonstrate the effects of propagation of light.
09.06 Demonstrate the interference light.
09.07 Demonstrate the diffraction of light.
09.08 Distinguish between specular, diffuse and fresnel reflections.
09.09 Demonstrate the use of polarizers.
09.10 Measure filter absorption and optical density.
09.11 Observe and calculate (using several light sources) the wave length and frequency of prominent spectral lines.
09.12 Assemble and align a HeNe laser resonator.
09.13 Measure beam diameter and divergence.
09.14 Set up and operate a spectrometer.
09.15 Demonstrate proper cleaning of an uncoated optical surface.
09.16 Measure and diagram reflection characteristics of plan surfaces.
09.17 Measure transmission and absorption of optical materials (propagation).
09.18 Analyze photodectors.
09.19 Troubleshoot photodectors.
09.20 Calibrate photodectors.

10.0 DEMONSTRATE PROFICIENCY IN OPTICAL SYSTEMS, MAKING USE OF WAVE CHARACTERISTICS OF LIGHT--The student will be able to:

10.01 Measure and diagram reflection characteristics of spherical surfaces.
10.02 Measure and diagram refraction characteristics of plan surfaces.
10.03 Measure and diagram refraction characteristics of spherical surfaces.
10.04 Demonstrate diffraction and interference.
10.05 Demonstrate polarization characteristics of light.
10.06 Demonstrate the optical characteristics of prisms.
10.07 Demonstrate the optical characteristics of windows.
10.08 Demonstrate the fundamental characteristics of wedges.
10.09 Measure the local length of spherical single lenses.
10.10 Demonstrate the optical path differences in thin films.
10.11 Design and construct a laser-up collimator.
10.12 Measure the wave length of basic lasers.
10.13 Measure the temporal output of basic lasers.
10.14 Measure the spatial output of basic lasers.
10.15 Make a qualitative interpretation and assessment of the surface quality of a test optical surface, based on the interference patterns produced from the surfaces of an optical flat, wedged and curved spherical.
10.16 Set up and operate a monochromator.
10.17 Set up and operate a Michelson interferometer.
10.18 Set up and operate a Fabry-Perot interferometer.
10.19 Set up and operate a Twyman-Green interferometer.
10.20 Measure the longitudinal mode spacing of a TEMOoo laser, utilizing optical spectrum analyzer.

11.0 DEMONSTRATE PROFICIENCY IN OPERATING OUTPUT BEAM CHARACTERISTICS OF VARIOUS GAS LASERS--The student will be able to:

11.01 Analyze power sources for CW lasers (gas and solid state).
11.02 Troubleshoot power sources for CW lasers (gas and solid state).
11.03 Analyze pulsed laser power supplies.
11.04 Troubleshoot pulsed laser power supplies.
11.05 Analyze energy transfer in laser systems (automatic, ionic and molecular).
11.06 Calculate energy transfer in laser systems (atomic, ionic and molecular).

11.07 Analyze CW lasers.
11.08 Troubleshoot CW lasers.
11.09 Analyze pulsed lasers.
11.10 Troubleshoot pulsed lasers.
11.11 Demonstrate the effects of Q-switching.
11.12 Demonstrate the use of autocollimators.
11.13 Demonstrate Q-switching methods (dye, EO, AO and mechanical).
11.14 Demonstrate use of modulators and deflators.
11.15 Calculate/measure percentage of transmission of CW CO2 laser beam through uncoated GE lens.
11.16 Combine helium, nitrogen and carbon dioxide in CO2 laser and determine power output for various mixture ratios.

12.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE LASERS IN VARIOUS OPERATIONAL MODES--The student will be able to:

12.01 Analyze and troubleshoot flashlamp ignition and simmer circuits.
12.02 Determine beam convergence as function of lamp current to produce graph of lamp current vs. Nd:YAG laser.
12.03 Demonstrate Q-switching methods.
12.04 Demonstrate frequency doubling in Nd:YAG laser.
12.05 Measure output beam characteristics of a pulsed Nd:YAG laser.
12.06 Design and construct a breadboard pulse-forming network containing a gas-filled flashlamp.

13.0 DEMONSTRATE PROFICIENCY IN LASER SYSTEMS DESIGNS APPROPRIATE TO ASSIGNED APPLICATIONS--The student will be able to:

13.01 Choose the best laser to use for a given material processing application.
13.02 List the variables that determine the speed and quality of material procession applications.
13.03 Measure and adjust the output characteristics of laser beams.
13.04 Describe the alignment procedure of an articulated arm beam delivery system.
13.05 Draw a schematic illustration of the optical system of a micromanipulator used to position a CO2 laser beam on a medical target.
13.06 Demonstrate the effect on a tissue target of varying the focal length of an objective lens
13.07 Determine atmospheric attenuation factors, and the amount of laser power-energy needed to transmit a laser beam over a given range through specified atmospheric conditions.
13.08 List 5 major differences and the same number of similarities of Nd:YAG lasers used for each of the three major applications.
13.09 List 5 major differences and the same number of similarities of CO2 lasers used for each of the three major applications.
13.10 Describe the difference between target designators and rangefinders.

14.0 DEMONSTRATE PROFICIENCY PLANNING AND DOCUMENTING A LASER-ORIENTED PROJECT--The student will be able to:

14.01 Demonstrate medical laser safety.
14.02 Demonstrate ANSI laser safety standards.
14.03 Demonstrate CDRH laser safety standards.
14.04 Perform safety assessment of a facility which uses laser devices.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to

accurately fill out forms/invoices commonly used in business and industry.

15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Identify characteristics of the American enterprise system.
19.02 Define inflation and deflation.
19.03 Illustrate the basic economic questions facing any society.
19.04 Determine the results of a change in demand or a change in supply.
19.05 List factors which contribute to economic growth.
19.06 Identify characteristics of different types of business ownership.
19.07 Choose appropriate action in a situation requiring application of

business ethics.

CURRICULUM FRAMEWORK　　　　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　　　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Laser Electro-Optic Technology

CODE NUMBER: Secondary ________ Postsecondary 1150304

Florida CIP 0615.030400

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: TEC ELEC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electrical and electronics technicians (22505222), laser electro-optic technicians (019.181-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content includes, but is not limited to the following: identification, use and maintenance of lasers and laser systems; use of optical elements; performance of laser technology applications; calibration, troubleshooting and analyzing laser peripheral components; and demonstration of laser energy applications.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students will receive instruction in laser safety, optical cleaning, use of applicable laser test equipment, optical systems, laser technology, laser peripheral components, laser applications, laser projects and laser optics measurements.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Electronic Technology and/or Electronic Engineering Technology are prerequisites for entry into this electronic specialization. Algebra is

recommended as a prerequisite for entry into this program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800-2000 hours when content from the Florida common core electronics program (Electronics Technology) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Identify, use and maintain lasers and laser systems.
02. Demonstrate and practice the uses of optical elements.
03. Demonstrate and analyze wave optical systems.
04. Perform laser technology applications.
05. Calibrate, troubleshoot and analyze laser peripheral components.
06. Demonstrate and practice laser energy applications.
07. Analyze, construct and demonstrate laser optical measurements.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial   SECONDARY NUMBER:

PROGRAM TITLE: Laser Electro-Optic Technology   POSTSECONDARY NUMBER: I150304

01.0 DEMONSTRATE PROFICIENCY, IDENTIFICATION AND USE OF LASERS--The student will be able to:

01.01 Identify and apply laser safety practices.
01.02 Define and identify the elements and operation of a laser.
01.03 Operate a power meter.
01.04 Demonstrate proper cleaning techniques for optical material.
01.05 Identify and utilize component supports.
01.06 Analyze the use of filters and beam-splitters.
01.07 Define and analyze the properties of light.
01.08 Measure and analyze the emission and absorption of light.
01.09 Define and analyze lasing action.
01.10 Identify, analyze and define optical cavities and modes of oscillation.

02.0 DEMONSTRATE AND PRACTICE THE USE OF OPTICAL ELEMENTS--The student will be able to:

02.01 Describe and analyze temporal characteristics.
02.02 Describe and analyze spatial characteristics.
02.03 Define and analyze the characteristics of a gas laser.
02.04 Define laser classifications and characteristics.
02.05 Define reflection and refraction.
02.06 Apply principles of reflection graphically and experimentally.
02.07 Apply principles of refraction graphically and experimentally.
02.08 Apply principles of imaging with a single lens graphically and experimentally.
02.09 Apply principles of imaging with a multiple lens graphically and experimentally.
02.10 Apply principles of the effect of F-stop and apertures graphically and experimentally.

03.0 DEMONSTRATE AND ANALYZE WAVE OPTICAL SYSTEMS--The student will be able to:

03.01 Identify and analyze light sources and their characteristics.
03.02 Define and describe the quantities of radiometric and photometric in the radiation of energy/power.
03.03 Describe and define the wave nature of light.
03.04 Analyze reflection and refraction using the principles of the wave nature of light.
03.05 Identify and apply the effects of propagation of light.
03.06 Demonstrate the interference light.
03.07 Define and apply the principles of the diffraction of light.
03.08 Demonstrate the polarization of light.
03.09 Operate polarizers.
03.10 Define and analyze the coupling of light into fiber optics.
03.11 Analyze the propagation of light in fiber optics.
03.12 Describe the construction of optical fibers.
03.13 Identify and describe the losses in fiber optics.
03.14 Identify the advantages and disadvantages of fiber optics.

04.0 PERFORM LASER TECHNOLOGY APPLICATIONS--The student will be able to:

04.01 Define and apply nondestructive testing techniques.

04.02 Define and apply range finding.
04.03 Define and apply alignment and angle testing.
04.04 Construct four types of interferometers.
04.05 Construct and use a holography system.

05.0 CALIBRATE, TROUBLESHOOT, AND ANALYZE LASER PERIPHERAL COMPONENTS--The student will be able to:

05.01 List the properties of different types of optical materials.
05.02 Define and demonstrate the limitations of optical materials.
05.03 Define and demonstrate windows and flats.
05.04 Define and demonstrate mirrors and etalons.
05.05 Apply and analyze prisms.
05.06 Apply and analyze the use of lenses.
05.07 Apply and analyze the use of gratings.
05.08 Apply and define nonlinear materials.
05.09 Apply beam expanders and spatial filters.

06.0 DEMONSTRATE AND PRACTICE LASER ENERGY APPLICATIONS--The student will be able to:

06.01 Apply and define laser safety, hazards and evaluation.
06.02 Troubleshoot and analyze pulsed laser flashlamps and power supplies.
06.03 Troubleshoot and use power sources for CW lasers.
06.04 Define and analyze the use of CW solid lasers-efficiency and cooling.
06.05 Measure and record laser power and energy.
06.06 Apply laser beam divergence and focusing.
06.07 Troubleshoot and define optically pumped pulsed solid lasers.
06.08 Troubleshoot and define laser Q-switching.
06.09 Apply and define semiconductor lasers.

07.0 ANALYZE, CONSTRUCT AND DEMONSTRATE LASER OPTICAL MEASUREMENTS --The student will be able to:

07.01 Operate and analyze electro-optic devices.
07.02 Operate and analyze acousto-optic devices.
07.03 Define mode-locking.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.

09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Identify characteristics of the American enterprise system.
12.02 Define inflation and deflation.
12.03 Illustrate the basic economic questions facing any society.
12.04 Determine the results of a change in demand or a change in supply.
12.05 List factors which contribute to economic growth.
12.06 Identify characteristics of different types of business ownership.
12.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Lathing

CODE NUMBER: Secondary ______ Postsecondary I460211

Florida CIP 0646.020101

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G DRYWALL @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a lather (87114548), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading and interpretation, estimating, and the installation of interior and exterior wall systems and lathing.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools, equipment and materials in the installation of interior and exterior lathing, furring and wall systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Demonstrate understanding of prevailing building codes.
03. Identify and select appropriate materials for specific jobs.
04. Erect scaffolds and ladders.
05. Install interior lathing and furring to American National Standards specifications.
06. Install exterior wall systems.
07. Develop material and cost estimates.
08. Install suspended ceiling framework.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Lathing POSTSECONDARY NUMBER: I460211

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Identify electrical symbols.
01.02 Read engineers' scale.
01.03 Read and interpret blueprints and specifications.
01.04 Identify lines and symbols.
01.05 Read architect's scales.
01.06 Interpret legends on blueprints.

02.0 DEMONSTRATE UNDERSTANDING OF PREVAILING BUILDING CODES--The student will be able to:

02.01 Interpret and apply industry safety codes.
02.02 Select materials to trade standards.
02.03 Read and follow manufacturer's recommendations for material application and use.
02.04 Interpret and apply state standard building code.

03.0 IDENTIFY AND SELECT APPROPRIATE MATERIALS FOR SPECIFIC JOBS--The student will be able to:

03.01 Select lath base compatible to different plaster systems.
03.02 Erect horizontal metal framework to fasten lath using bolts, and power-actuated fastening guns.
03.03 Apply adhesives or caulking in accordance with manufacturer's recommendations.
03.04 Install gypsum lath to walls and ceilings using adhesives, nails or screws.
03.05 Smooth edges of gypsum lath using rasp or sand paper.
03.06 Measure and cut gypsum lath with utility knife and straightedge.
03.07 Measure and cut gypsum lath to fit openings and projections.

04.0 ERECT SCAFFOLDS AND LADDERS--The student will be able to:

04.01 Erect and use extension ladders.
04.02 Erect scaffolds.

05.0 INSTALL INTERIOR LATHING AND FURRING TO AMERICAN NATIONAL STANDARDS SPECIFICATIONS--The student will be able to:

05.01 Layout interior wall systems in accordance with specifications and blueprints.
05.02 Layout interior ceiling systems in accordance with specifications and blueprints.
05.03 Fasten metal lath to walls and ceilings.
05.04 Fasten gypsum lath to walls and ceilings.
05.05 Provide anchor for furring in floor, ceiling and walls.
05.06 Nail on lathing materials.
05.07 Fasten lath using handtools and portable power tools.
05.08 Shim or fur uneven or damaged surfaces to provide insulation space or moisture barrier by using metal and wood furring.
05.09 Weld metal frame supports to steel structural members.
05.10 Install metal casings door frame and frames.
05.11 Install suspended carriers or channels to overhead structural framework.

05.12 Attach preformed corner reinforcements.
05.13 Bend and shape metal lath.
05.14 Wire, nail, clip, or staple lath to framework, ceiling joists, and flat concrete surfaces.
05.15 Wire horizontal strips to furring.

06.0 INSTALL EXTERIOR WALL SYSTEMS--The student will be able to:

06.01 Layout exterior wall systems in accordance with specifications and blueprints.
06.02 Layout exterior ceiling systems in accordance with specifications and blueprints.
06.03 Erect and install exterior studding.
06.04 Install exterior gypsum sheeting.
06.05 Apply and install K-lath, strip lath, and paperback metal lath.
06.06 Layout and install exterior trim, plaster accessories, and plastering grounds.
06.07 Fasten exterior systems by welding, screwing, driving, or tieing.
06.08 Install and erect knee walls, curtain walls or parapet walls.

07.0 DEVELOP MATERIAL AND COST ESTIMATES--The student will be able to:

07.01 Analyze and project material costs.
07.02 Estimate quantities.

08.0 INSTALL SUSPENDED CEILING FRAMEWORK--The student will be able to:

08.01 Layout ceilings in accordance with plans and specifications.
08.02 Install suspension systems.
08.03 Install carriers and runners.
08.04 Frame furring to reflected ceiling plans.
08.05 Install plaster base, grounds, trims, or accessories.
08.06 Install acoustical ceiling and grid system.
08.07 Install acoustical ceiling accessories and trim.
08.08 Install acoustical tiles or panels.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Light Commercial Heating and Air Conditioning

CODE NUMBER: Secondary _____ Postsecondary I470261

Florida CIP 0647.026100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS X

APPLICABLE LEVEL(S): _____6-9 ____9-12 X Postsecondary Adult Vocational

_____Postsecondary Vocational _____ Other30-31

CERTIFICATION COVERAGE: AC HEAT ME @ 7 G, REFRG MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as installer-servicers in light commercial air conditioning (637.261-014), or to provide supplemental training for persons previously or currently employed in these occupations. Individuals completing this program will be qualified to work in the industry as light commercial air conditioning technicians.

The content includes, but is not limited to, planning, installation, testing and servicing of light commercial air conditioning systems and components; servicing, installation and troubleshooting electrical and mechanical components; testing, diagramming and solving problems in air conditioning, refrigeration and heating equipment; record keeping; supervisory skills; use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

The course contest should also include training in communication skills, leadership skills, human relations and employability skills, safe and efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use of specialized tools and equipment, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10, Language 9, Reading 9. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan signed by the student, which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The average length of this program for the typical student is 1800 hours when content from the Florida common core air conditioning refrigeration and heating program (Air Conditioning, Refrigeration and Heating Mechanics) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate a basic understanding of refrigeration.
02. Demonstrate proficiency in refrigeration cycle/diagrams.
03. Demonstrate a knowledge of refrigeration-servicing and testing equipment.
04. Demonstrate a knowledge of heating-servicing and testing equipment.
05. Demonstrate a knowledge of air flow.
06. Demonstrate proficiency n refrigeration-piping materials and fabrication.
07. Demonstrate proficiency in refrigeration-pipe sizing and troubleshooting.
08. Demonstrate proficiency in basic electricity.
09. Demonstrate proficiency in electrical generation and distribution.
10. Demonstrate proficiency in electrical components/motors.
11. Demonstrate proficiency in solid state electronics.
12. Demonstrate proficiency in valves and regulators.
13. Demonstrate proficiency in sensing devices/heating controls.
14. Demonstrate proficiency in commercial and engineered control systems.
15. Demonstrate an understanding of refrigeration load.
16. Demonstrate proficiency in psychometrics.
17. Demonstrate proficiency in estimating heating and cooling load.
18. Demonstrate proficiency in evaporators.
19. Demonstrate proficiency in compressors.
20. Demonstrate proficiency in condensers.
21. Demonstrate an understanding of accessories.
22. Demonstrate an understanding of central station systems.
23. Demonstrate an understanding of absorption refrigeration.
24. Demonstrate an understanding of hydronic systems.
25. Demonstration proficiency in air flow principles/duct design.
26. Demonstrate an understanding of air handling fans.
27. Demonstrate appropriate communication skills.
28. Demonstrate appropriate understanding of basic science.
29. Demonstrate appropriate math skills.
30. Demonstrate employability skills.
31. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER: ________
PROGRAM TITLE: Light Commercial Air Conditioning
POSTSECONDARY NUMBER: I470261

01.0 DEMONSTRATE A BASIC UNDERSTANDING OF REFRIGERATION--The student will be able to:

01.01 Demonstrate a basic understanding and appreciation of air conditioning and its impact on society.

02.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION CYCLE/DIAGRAMS--The student will be able to:

02.01 Identify all zones and lines on the pressure enthalpy (PH) chart.
02.02 State the unit of measurement for H (Btu/lb) on the pressure enthalpy (PH) chart.
02.03 Define enthalpy and entropy.
02.04 Diagram a simple cycle using the pressure enthalpy (PH) chart.
02.05 Show arrows for direction of cycle on the (PH) chart.
02.06 Calculate qe on the (PH) chart.
02.07 Calculate qw on the (PH) chart.
02.08 Calculate qc on the (PH) chart.
02.09 Calculate MFR (mass flow rate) on the (PH) chart.
02.10 Demonstrate an understanding of VFR (volume flow rate) on the (PH) chart.
02.11 Demonstrate an understanding of THP (theoretical power) on the (PH) chart.
02.12 Demonstrate and understanding of COP (coefficient of performance) on the (PH) chart.
02.13 Demonstrate an understanding of the effect of superheating the suction gases on the (PH) chart.
02.14 Demonstrate an understanding of the effect of increased condensing pressure on the (PH) chart.
02.15 Demonstrate an understanding of the effect of subcooling the liquid on the (PH) chart.
02.16 Explain the benefits of superheat and subcooling.
02.17 Identify the effects of improper refrigerant.

03.0 DEMONSTRATE A KNOWLEDGE OF REFRIGERATION-SERVICING AND TESTING EQUIPMENT--The student will be able to:

03.01 Double and triple evacuate system with a two stage vacuum pump.
03.02 Properly use a micron gauge.
03.03 Properly use a mercury U-tube.

04.0 DEMONSTRATE A KNOWLEDGE OF HEATING-SERVICING AND TESTING EQUIPMENT--The student will be able to:

04.01 Use a draft gauge.
04.02 Measure gas pressures with a U-tube manometer.
04.03 Use a smoke tester.
04.04 Use CO2 and O2 testers.
05.05 Use a vacuum gauge.
04.06 Use an oil pressure gauge.
04.07 Use a sling psychrometer.

05.0 DEMONSTRATE A KNOWLEDGE OF AIR FLOW--The student will be able to:

05.01 Use a pilot tube.

05.02 Use an inclined manometer.
05.03 Use an air velocity meter.
05.04 Use a magnahelic gauge.
05.05 Balance an air distribution system.

06.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION-PIPING MATERIALS AND FABRICATION--The student will be able to:

06.01 Describe procedures used to protect valves/fittings from heat damage.
06.02 Describe the applications of vibration eliminators.

07.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION-PIPE SIZING AND TROUBLESHOOTING--The student will be able to:

07.01 Determine capacities of refrigerant lines.
07.02 Determine equivalent lengths of fittings.
07.03 Calculate total effective length of pipe run.
07.04 Calculate amount of refrigerant in lines.
07.05 Describe use of traps in suction risers.
07.06 Explain pressure drop.
07.07 Explain saturation temperature drop.
07.08 Calculate pressure drop in liquid line risers.
07.09 Size double risers.
07.10 Size hot gas line.
07.11 Size liquid line from condenser to receiver.

08.0 DEMONSTRATE PROFICIENCY IN BASIC ELECTRICITY--The student will be able to:

08.01 Define and compare single and multi-phase voltage and current.
08.02 Use Ohm's Law to calculate various circuit quantities.
08.03 Calculate electrical circuit loads.
08.04 Interpret tables and charts from National Electrical Code (NEC).

09.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL GENERATION AND DISTRIBUTION--The student will be able to:

09.01 Demonstrate the ability to figure wire sizes and voltage drops.
09.02 Draw and identify power transformer types.
09.03 Size and test fuses and breakers and safely replace them.

10.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL COMPONENTS/MOTORS--The student will be able to:

10.01 Define electromotive force, counter electromotive, torque and rotation.
10.02 Define and explain the use or function of sequencers.
10.03 Define and explain the use or function of damper actuators.
10.04 Explain the operation and application of a three phase motor.
10.05 Explain the operation and application of variable speed motors.
10.06 Explain the operation and application of shaded pole.
10.07 Explain the operation and application of permanent split capacitor.
10.08 Demonstrate proper use of testing equipment for motors.
10.09 Describe lubrication methods for motors.

11.0 DEMONSTRATE PROFICIENCY IN SOLID STATE ELECTRONICS--The student will be able to:

11.01 Explain basic solid state circuits.
11.02 Identify, test, and replace circuit boards.

12.0 DEMONSTRATE PROFICIENCY IN VALVES AND REGULATORS--The student will be able to:

12.01 Test gas valve operation.

12.02 Check voltage at gas valve operator.
12.03 Check pressure at inlet vs. outlet of gas valve.
12.04 Perform regular conversion on gas valve from natural gas to LP or reverse.
12.05 Identify low type gas valves.
12.06 Identify line voltage type gas valves.
12.07 Identify redundant type gas valves.
12.08 Identify two-stage modulating type gas valves.
12.09 Explain the operation of solenoid valve.
12.10 Explain direct vs. servo regulation.
12.11 Identify limited/non-adjustable/adjustable regulators.
12.12 Describe methods for selecting correct replacement gas valves.

13.0 DEMONSTRATE PROFICIENCY IN SENSING DEVICES/HEATING CONTROLS--The student will be able to:

13.01 Differentiate between pilot devices.
13.02 Explain the operation of flame rod, mercury flame switch, bimetal and millivolt flame sensors.
13.03 Test and change a thermocouple flame sensor.
13.04 Test spark ignition modules.
13.05 Perform safety lockout procedures for burners.
13.06 Measure resistance of cad cell during operation.
13.07 Explain operation of an oil delay valve.
13.08 Install, set, and test a fan limit control.
13.09 Install, set, and test a high limit.
13.10 Connect and test a humidistat
13.11 Connect and test a control circuit for an electronic air cleaner.
13.12 Describe methods of freeze and defrost control.

14.0 DEMONSTRATE PROFICIENCY IN COMMERCIAL AND ENGINEERED CONTROL SYSTEMS--The student will be able to:

14.01 Identify electromechanical control systems.
14.02 Identify pneumatic control systems.
14.03 Identify electronic control systems.
14.04 Identify programmable control systems.
14.05 Describe sequences of operation of types of control systems.
14.06 Construct a schematic diagram using all components necessary to safely operate an air conditioner, heat pump, furnace and chiller system.
14.07 Program a programmable thermostat for heating, cooling and heat pump operation including set up and set back.

15.0 DEMONSTRATE AN UNDERSTANDING OF REFRIGERATION LOAD--The student will be able to:

15.01 Define "U" value (Btu/hr. ft2-F).
15.02 Define "K" value (Fft2 hr./Btu).
15.03 Define "C" value (Fft2 hr./Btu).
15.04 Define "R" value (Fft2 hr./Btu).
15.05 Interpret heat transfer tables ("U, K, C, R").
15.06 Calculate total heat transfer value of any surface (R) - (U)>
15.07 Explain conduction heat load source.
15.08 Explain infiltration as a heat load source.
15.09 Explain misc. loads (people, motors, equipment) as heat sources.
15.10 Explain the purpose of vapor barriers.

16.0 DEMONSTRATE PROFICIENCY IN PSYCHROMETRICS--The student will be able to:

16.01 Identify the dry bulb line (DB).
16.02 Identify the wet bulb line (WB).
16.03 Identify relative humidity (RH).

16.04 Identify dew point (DP)>
16.05 Identify enthalpy (h).
16.06 Identify specific humidity (grains of moisture) or (Lbw/Lbda).
16.07 Identify apparatus dew point.
16.08 Calculate refrigeration sensible heat ratio.
16.09 Calculate contact factor.
16.10 Calculate latent heat.
16.11 Calculate sensible heat.
16.12 Calculate total heat.
16.13 Calculate water removal.
16.14 Calculate mixed air condition.
16.15 Explain specific humidity.
16.16 Explain apparatus dew point.
16.17 Explain contact factor.
16.18 On a psychrometric chart, plot sensible heating.
16.19 On a psychrometric chart, plot sensible cooling.
16.20 On a psychrometric chart, plot heating and humidifying.
16.21 On a psychrometric chart, plot heating and dehumidifying.
16.22 On a psychrometric chart, plot cooling and humidifying.
16.23 On a psychrometric chart, plot cooling and dehumidifying.
16.24 On a psychrometric chart, plot humidifying.
16.25 On a psychrometric chart, plot dehumidifying.
16.26 On a psychrometric chart, plot cooling cycle.
16.27 On a psychrometric chart, plot mixed air process.

17.0 DEMONSTRATE PROFICIENCY IN ESTIMATING HEATING AND COOLING LOAD--The student will be abe to:

17.01 Interpret design data.
17.02 Calculate "R" and "U" values for building material.
17.03 Calculate CLTD (coding load temperature difference).
17.04 Make corrections for CLTD>
17.05 Calculate heating and cooling loads for walls.
17.06 Calculate heating and cooling loads for windows.
17.08 Calculate heating and cooling loads for doors.
17.09 Calculate heating and cooling loads for non-conditioned space.
17.10 Calculate heating and cooling loads for floors.
17.11 Calculate lighting load.
17.12 Calculate equipment loads.
17.13 Calculate infiltration and ventilation loads.
17.14 Calculate duct losses.
17.15 Calculate refrigeration sensible heat ratio.

18.0 DEMONSTRATE PROFICIENCY IN EVAPORATORS--The student will be able to:

18.01 Identify chiller evaporators.
18.02 Adjust the proper coil air flow.
18.03 Check coil performance.

19.0 DEMONSTRATE PROFICIENCY IN COMPRESSORS--The student will be able to:

19.01 Describe the operation of screw methods of compression.
19.02 Describe the operation of scroll methods of compression.
19.03 Describe the operation of reciprocating compressors.
19.04 Determine the system balance based on the selected components.
19.05 Describe lubrication methods for compressors.
19.06 Describe methods of compressor unloading.

20.0 DEMONSTRATE PROFICIENCY IN CONDENSERS--The student will be able to:

20.01 Identify and describe evaporative condenser.
20.02 Determine proper air and water flow.

20.03 Adjust the air flow for proper temperature difference.
20.04 Adjust water flow for proper GPM and temperature difference.

21.0 DEMONSTRATE AN UNDERSTANDING OF ACCESSORIES--The student will be able to:

21.01 Describe the proper location of accumulators.
21.02 Describe the proper location of suction filters.
21.03 Describe the proper location of oil separators.
21.04 Describe the proper location of head pressure controls.
21.05 Describe the proper location of solenoid valves.
21.06 Describe the proper location of evaporator pressure regulating valve.
21.07 Describe the proper location of crankcase regulating valves.
21.08 Describe the proper location of heat exchangers.
21.09 Adjust the air flow for proper temperature difference.
21.10 Adjust water flow for proper GPM and temperature difference.

22.0 DEMONSTRATE AN UNDERSTANDING OF CENTRAL STATION SYSTEMS--The student will be able to:

22.01 Identify and explain water chillers.
22.02 Identify and explain boilers.
22.03 Identify and explain air handlers.
22.04 Identify and explain water cooling towers.
22.05 Identify and explain pneumatic controls.

23.0 DEMONSTRATE AN UNDERSTANDING OF ABSORPTION REFRIGERATION--The student will be able to:

23.01 Demonstrate an understanding of the components of the absorption system.
23.02 Describe the sequence of operation of the absorption system.
23.03 Differentiate between the two major absorption systems.

24.0 DEMONSTRATE AN UNDERSTANDING OF HYDRONIC SYSTEMS--The student will be able to:

24.01 Check circulator.
24.02 Set aquastat.
24.03 Check water regulating valve operation.
24.04 Inspect/change zone valve operation.
24.05 Remove air from water system.
24.06 Wire multizone/multipump hydronic system.
24.07 Identify types of hydronic piping.
24.08 Check boiler efficiency and clean.

25.0 DEMONSTRATE PROFICIENCY IN AIR FLOW PRINCIPLES/DUCK DESIGN--The student will be able to:

25.01 Lay out return and supply runs.
25.02 Calculate equivalent length of trunk and branch ducts.
25.03 Calculate total effective length of duct runs.
25.04 Calculate total available static pressure.
25.05 Size trunk and branch ducts by equal friction method.
25.06 Use duct calculator to find duct size, velocity, cfm, and friction loss.
25.07 Calculate air flow factors for heating and cooling.
25.08 Size register, grilles and diffusers.

26.0 DEMONSTRATE AN UNDERSTANDING OF AIR HANDLING FANS--The student will be able to:
26.01 Explain the difference between tubeaxial and vaneaxial.
26.02 Interpret the fan curve.
26.03 Check fan performance via curves.

27.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

27.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
27.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
27.03 Read and follow written and oral instructions.
27.04 Answer and ask questions coherently and concisely.
27.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
27.06 Demonstrate appropriate telephone/communication skills.

28.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

28.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
28.02 Draw conclusions or make inferences from data.
28.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
28.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

29.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

29.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
29.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
29.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
29.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
29.05 Demonstrate an understanding of federal, state and local taxes and their computation.

30.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

30.01 Define entrepreneurship.
30.02 Describe the importance of entrepreneurship to the American economy.
30.03 List the advantages and disadvantages of business ownership.
30.04 Identify the risks involved in ownership of a business.
30.05 Identify the necessary personal characteristics of a successful entrepreneur.
30.06 Identify the business skills needed to operate a small business efficiently and effectively.

31.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct a job search.
31.02 Secure information about a job.
31.03 Identify documents which may be required when applying for a job interview.
31.04 Complete a job application form correctly.
31.05 Demonstrate competence in job interview techniques.
31.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
31.07 Identify acceptable work habits.
31.08 Demonstrate knowledge of how to make job changes appropriately.
31.09 Demonstrate acceptable employee health habits.
31.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Logistics Systems Technology

CODE NUMBER: Secondary ______ Postsecondary ______

Florida CIP 0615.060301

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS __

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational ______ Other ____________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as logistics technicians, or to provide supplemental training for persons previously or currently employed in these occupations.

This program includes a common core of general education competencies as identified by the industry, which is prerequisite for all Associate in Science Degree programs. This program prepares individuals to enter the Logistics career field as technicians.

The specialization content should include, but not be limited to, logistics systems, technical manuals, support services, management of spares, materials and repair, and logistics design and management.

The general education content includes, but is not limited to, general mathematics, statistics, physics, computer applications, and economics. Integrated into this content will be communication skills, leadership skills, human relation skills, employability skills, safe and efficient work practices, technical recording and reporting.

Elective competencies are chosen from courses in transportation, management, supervision, and computer applications. A minimum of 15 semester hours with at least two components of this core must be of courses designed to develop skills in oral and written communication and in computational skills.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are primarily involved with computer simulation systems and are considered an integral part of this program.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

As part of an Associate in Science Degree, there is a major component of general education requirements which allow the student to more easily relate the technical knowledge gained to a theoretical level and to allow for a greater knowledge expansion and transference in the future.

The cooperative method of instruction may be utilized for this program.

Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is 63-75 semester hours.

Instruction in microcomputer applications and high level languages is appropriate for inclusion in this program. Algebra is a recommended prerequisite for entry into this program.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in the analysis of the concepts and philosophies of integrated logistics support.
02. Demonstrate proficiency in the analysis of the responsibilities of a logistician.
03. Demonstrate proficiency in the analysis of various types of logistic support systems.
04. Demonstrate proficiency in organization and the generation of technical manuals.
05. Demonstrate proficiency in the integration of all logistics functions into a total support system.
06. Demonstrate proficiency in the organization of training support systems.
07. Demonstrate proficiency in the organization of a total repair program for a product being introduced into the marketplace.
08. Demonstrate proficiency in the design of a materials management system.
09. Demonstrate proficiency in the use of word processing, spreadsheets and data management systems using microcomputers.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Logistics Systems Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF THE CONCEPTS AND PHILOSOPHIES OF INTEGRATED LOGISTICS SUPPORT--The student will be able to:

01.01 Describe the principle elements of Integrated Logistics Support.
01.02 Describe the role of the logistician in government contract implementation.
01.03 List the data items included in a major systems contract that are included under the area of responsibility of the logistician.
01.04 Show how the inclusion of integrated logistics support begins with the planning for an item of equipment and continues throughout its useful life.
01.05 Describe the role of reliability engineering in integrated logistics support.
01.06 Explain the relationship of production testing in insuring overall product reliability.
01.07 Describe the concepts of maintainability engineering and how they interrelate to the goals and objectives of the logistician.
01.08 List the components of and show how maintenance planning is a part of the overall implementation of the logistics system.
01.09 Describe the procedures used to identify and obtain the initial stock of spare parts required to support fielded equipment.
01.10 Discuss the organization and acquisition of equipment used to support and test new systems including built-in test equipment.
01.11 Identify the organization of the personnel and technical manual requirements needed to support a new system.
01.12 Describe the components of a proper training system.
01.13 List the four categories of a training system.
01.14 Describe the procedure to develop a training program and identify the training equipment required to support the training program.
01.15 Describe the overall DoD supply system.
01.16 Analyze the requirements for spare parts and inventory management.
01.17 Describe the purpose and requirements of MIL-STD 1367, Packaging, Handling, Storing, and Transportability Program Requirements for Systems and Equipments.
01.18 Analyze the role of the System Safety Engineer in equipment design.
01.19 Describe the application of human engineering as it applies to insuring the safe and efficient operation of equipment and systems.
01.20 Explain why the resource requirements for the support of operation and maintenance of equipment, training, and storage are an important part of overall planning.
01.21 Explain how Repair-Level Analysis is used to evaluate a maintenance action to determine if it is cost effective and where the task can be accomplished most cost effectively.
01.22 Explain how Reliability-Centered Maintenance will develop a scheduled maintenance program which will increase the availability of equipment.
01.23 List the advantages of prediction of the total costs that will be incurred throughout the life of a system.
01.24 Explain the justification for the process known as Logistic Support Analysis.
01.25 List the goals for Logistic Support Analysis.
01.26 Analyze the content of MIL-STD 1388-1A, Logistic Support Analysis.
01.27 Explain how the Integrated Logistics Support Plan is coordinated

with and integrated into the overall Logistics support activities.

01.28 Explain how the Integrated Support Plan establishes the policies, procedures, and methods for implementation of a contractor's ILS program.

01.29 Describe the federal government contracting process, different types of contracts, and proposed preparation and pricing.

01.30 Explain how the business activities of a company are separate from the product or service activities.

01.31 List the aspects that must be addressed in order to insure successful program management.

02.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF THE RESPONSIBILITIES OF A LOGISTICIAN--The student will be able to:

02.01 Define spares management.
02.02 Describe the functions and responsibilities of spares management.
02.03 Describe the inter-relationship between spares management and other logistics disciplines.
02.04 Identify and describe the activities involved in spares management.
02.05 Describe and demonstrate how to accomplish budget forecasting.
02.06 Explain the steps required in spares cataloging.
02.07 Describe the operations and functions of inventory management.
02.08 Describe the operations of inventory control.
02.09 Describe various methods of spares management performance evaluations.
02.10 Demonstrate budget forecasting.
02.11 Define "source coding" in relationship to spares selection.
02.12 List the maintenance factors involved in spares management.
02.13 Give an example of "Configuration Control" under documentation/data management.

03.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF VARIOUS TYPES OF LOGISTIC SUPPORT SYSTEMS--The student will be able to:

03.01 Define Logistics design.
03.02 Describe the interrelationship between reliability and maintainability.
03.03 Demonstrate the use of logistics statistical techniques.
03.04 Identify system cost factors.
03.05 Identify logistics cost factors.
03.06 Explain the steps in the development of a maintenance concept.
03.07 Define the four levels of maintenance.
03.08 Explain how to conduct a logistics support analysis.
03.09 Define the test and evaluation categories.
03.10 Explain the relationship between quality control and Configuration Control.
03.11 Explain and/or demonstrate how to determine the MTBF or a sub-system or system.
03.12 Delineate a method for improving the MTBF when given examples of a sub-system or system with a designated MTBF.

04.0 DEMONSTRATE PROFICIENCY IN THE ORGANIZATION AND THE GENERATION OF TECHNICAL MANUALS.--The student will be able to:

04.01 Define technical manuals.
04.02 List types of technical manuals and their uses.
04.03 List and describe levels of technical manuals.
04.04 Explain the difference between commercial and military technical manuals.
04.05 Recognize Army, Navy, Air Force and Marine Corps manual numbers.
04.06 Define Data Item Description and DD Form 1423.

04.07 Define technical manual change systems.
04.08 Describe writing level as it pertains to military manuals.
04.09 Describe briefly technical manual distribution systems.
04.10 List several DOD specifications that pertain to technical manuals.
04.11 Explain maintenance concept in terms of a technical manual.
04.12 List various logistics data inputs used for technical manuals.
04.13 Describe functions of logistics data inputs.
04.14 Describe the technical manual research sources.
04.15 List steps in publishing technical manuals.
04.16 Explain personnel requirements for technical manuals.
04.17 Describe costs incurred in the production of technical manuals.

05.0 DEMONSTRATE PROFICIENCY IN THE INTEGRATION OF ALL LOGISTICS FUNCTIONS INTO A TOTAL SUPPORT SYSTEM.--The student will be able to:

05.01 Operate and program the Logistics Management Simulator.
05.02 Describe the basics logistics systems.
05.03 Review simulator tables of information.
05.04 Prepare sample simulator spares input sheets.
05.05 Prepare sample simulator repair input sheets.
05.06 Review simulator output sheets.
05.07 Prepare initial simulator spares and repair input sheets.
05.08 Review initial simulator spares and repair output sheets.
05.09 Prepare first step rate build-up input sheets.
05.10 Review first step rate build-up output sheets.
05.11 Prepare second step rate build-up input sheets.
05.12 Review second step rate build-up output sheets.
05.13 prepare third step rate build-up input sheets.
05.14 Review third step rate build-up output sheets.
05.15 Prepare fourth step rate build-up input sheets.
05.16 Review fourth step rate build-up output sheets.

06.0 DEMONSTRATE PROFICIENCY IN THE ORGANIZATION OF TRAINING SUPPORT SYSTEMS.--The student will be able to:

06.01 Define product support services and training.
06.02 Describe the functions and responsibilities of product support services and training representatives.
06.03 Describe the inter-relationship between product support services and training and other logistics disciplines.
06.04 List field service cost factors.
06.05 Explain the steps required in the preparation of product support services and training personnel.
06.06 Identify the various methods of product support services and training reporting.
06.07 Describe the operations and functions of in-house support.
06.08 Explain and give examples of the various methods of product support services and training performance evaluations.
06.09 Define the types of warranty and explain the company's liability with regard to warranties and product performance.
06.10 Demonstrate budget forecasting for a product under study.
06.11 Demonstrate how to fill out a time card.
06.12 List the steps to follow in Emergency Reporting.

07.0 DEMONSTRATE PROFICIENCY IN THE ORGANIZATION OF A TOTAL REPAIR PROGRAM FOR A PRODUCT BEING INTRODUCED INTO THE MARKETPLACE--The student will be able to:

07.01 Describe the how repair is a functional element of the integrated logistics process.
07.02 Describe the impact of maintenance and repair level analysis on the overall repair plan.
07.03 List the elements of a repair shop plan.

07.04 Show how workload forecasting and repair flow is a requirement of the overall repair plan.
07.05 Describe the process of repair cost forecasting.
07.06 Explain the process of warranty management.
07.07 List the key elements of repair planning.
07.08 Describe the elements of configuration control of items in repair.
07.09 Describe the integration of quality control into the process of repair management.
07.10 Discuss the role of engineering support as a component of the repair management process.

08.0 DEMONSTRATE PROFICIENCY IN THE DESIGN OF A MATERIALS MANAGEMENT SYSTEM--The student will be able to:

08.01 Describe the role of materials management in business.
08.02 Discuss the importance of quality assurance and reliability to the overall process of material management.
08.03 Explain the importance of standardization to proper specifications.
08.04 Explain the principles of sources of supply.
08.05 Explain the practices of sources of supply.
08.06 Describe the principles and practices of pricing.
08.07 Describe the standard principles and practices of contract negotiations.
08.08 Explain the principles of inventory management.
08.09 Explain the practices of inventory management.
08.10 Discuss the acquisition of capitol equipment.
08.11 Discuss the problems relating receiving and stores to materials management.
08.12 Describe the planning requirements of materials management.
08.13 List the standard procedures for organizing a materials management program.

09.0 DEMONSTRATE PROFICIENCY IN THE USE OF WORD PROCESSING, SPREADSHEETS AND DATA MANAGEMENT SYSTEMS USING MICROCOMPUTERS--The student will be able to:

09.01 Describe the component parts of a microcomputer system.
09.02 Explain the operation of a basic microcomputer.
09.03 Demonstrate the operation of the Disk Operating System (DOS).
09.04 Demonstrate the use of basic DOS commands.
09.05 Load a word processing applications program (WordPerfect).
09.06 Create a word processor document.
09.07 Demonstrate the use of the special features of the word processor.
09.08 Modify a word processor document.
09.09 Demonstrate the use of formatting functions, file management, and macros.
09.10 Demonstrate the use of advanced WordPerfect functions.
09.11 Build a worksheet document using VP-Planner Plus.
09.12 Format and print a worksheet.
09.13 Use advanced enhancement functions with the worksheet.
09.14 Build worksheets with functions and macros.
09.15 Demonstrate the use of the worksheet graphing functions.
09.16 Sort and query a worksheet database.
09.17 Create and display a database using dBase III Plus.
09.18 Display records in a database.
09.19 Demonstrate sorting and report preparation.
09.20 Demonstrate adding, changing, and deleting records.
09.21 Demonstrate changing the database structure.
09.22 Utilize commercially available software to generate computer graphics.
09.23 Apply data information management concepts in an EDP environment.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.

14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Machining

CODE NUMBER: Secondary ______ Postsecondary I480503

Florida CIP 0648.050300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: MACH SHOP @ 7 G METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinists (89108676), (600.280-022). This program also provides supplemental training for persons previously or currently employed in this occupation/these occupations.

The course content will include the following: shop math, blueprints, shaping metal parts to required size, bench work, precision measurement layout and inspection.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: set up and operation of grinders, buffers, cut off saws, drill presses, lathes, milling machines, electrical discharge (E.D.M.) machines and machines with computerized numerical controls.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in maintaining immediate work area.
02. Perform mathematical calculations.
03. Demonstrate proficiency in blueprint reading and machine planning.
04. Perform measuring operations.
05. Perform maintenance on machines and tools.
06. Perform bench work skills.
07. Set up and operate power saws.
08. Set up and operate pedestal grinders.
09. Set up and operate drill presses.
10. Set up and operate lathes.
11. Set up and operate milling machines.
12. Set up and operate grinding machines.
13. Set up and operate tool machines and cutters.
14. Apply computerized numerical control operations skills.
15. Set up and operate EDM machines.
16. Set up and operate heat treat furnaces.
17. Demonstrate appropriate communication skills.
18. Demonstrate appropriate understanding of basic science.
19. Demonstrate employability skills.
20. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial   SECONDARY NUMBER: ________

PROGRAM TITLE: Machining   POSTSECONDARY NUMBER: I480503

01.0 DEMONSTRATE PROFICIENCY IN MAINTAINING IMMEDIATE WORK AREA--The student will be able to:

01.01 Dispose of scrap metal chips, shavings, trash and waste.
01.02 Clean and maintain work areas affected by operations.
01.03 Leave area in safe condition.
01.04 Comply with shop safety rules and practices.
01.05 Comply with shop operating rules and practices.
01.06 Participate in "clean up" of work and shop areas.
01.07 Maintain a clean and orderly shop.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate an understanding of proper handling of hazardous waste and chemicals.

02.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

02.01 Make job-related decimal and fraction calculations.
02.02 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
02.03 Solve job-related problems using a hand-held calculator.
02.04 Solve job-related problems using basic formulas.
02.05 Solve job-related problems using basic geometry.
02.06 Measure a work piece and compare measurements with blueprint specifications.
02.07 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
02.08 Solve job-related problems using mathematical handbooks, charts, and tables.
02.09 Convert measurement from English to metric and from metric to English units.
02.10 Determine the clearance, relief and rake of cutting tools.
02.11 Calculate machine speed and feed by using appropriate formulas.
02.12 Solve job-related problems using basic trigonometry.

03.0 DEMONSTRATE PROFICIENCY IN BLUEPRINT READING AND MACHINE PLANNING--The student will be able to:

03.01 Interpret view concepts.
03.02 Read lines.
03.03 Read and interpret title blocks.
03.04 Read and interpret change orders on working and assembly prints.
03.05 Read and interpret abbreviations.
03.06 Make shop sketches.
03.07 Read and interpret blueprints including those with geometric tolerancing.
03.08 Determine and interpret reference information used in performing machine work.
03.09 Perform layout for precision machine work by using layout instruments.
03.10 Lay out radial and bolt hole circles.
03.11 Inspect, remove and replace manufactured parts that need repair or machine work.
03.12 Select the most productive tool and tooling for a given operation.
03.13 Apply principles of dimensioning.
03.14 Apply principles of tolerance expressions.
03.15 Define methods and importance of quality control.

03.16 Understand methods used for determining total cost involved in product production.

04.0 PERFORM MEASURING OPERATIONS--The student will be able to:

04.01 Read and measure with rules and calipers.
04.02 Read and measure with micrometers.
04.03 Read and measure with vernier tools.
04.04 Read and measure with dial indicators.
04.05 Measure with surface plates.
04.06 Read and measure with gage blocks and adjustable gages.
04.07 Measure with sine bars.
04.08 Take readings with hardness testers.
04.09 Take reading with optical comparators.
04.10 Inspect finished products.

05.0 PERFORM MAINTENANCE ON MACHINES AND TOOLS--The student will be able to:

05.01 Lubricate equipment parts.
05.02 Clean and store hand tools, cutters, fixtures, jigs and attachments.
05.03 Inspect and repair hand tools.
05.04 Inspect drive pulleys or belts.
05.05 Select lubricants for machining operations.
05.06 Inspect equipment for safe operational conditions.
05.07 Store grinding wheels.
05.08 Store precision tools.
05.09 Inspect and adjust machine guards.
05.10 Inspect work areas to assure a safe working environment.

06.0 PERFORM BENCH WORK SKILLS--The student will be able to:

06.01 Cut materials by using hand hacksaws.
06.02 Cut threads by using hand taps.
06.03 Cut threads by using dies.
06.04 Ream holes by using hand reamers.
06.05 Hand sharpen cutting tools by using abrasive stones.
06.06 Hone and lap surfaces.
06.07 Remove damaged screws and other hardware.
06.08 Set up and use arbor press broaches.
06.09 Deburr workpieces.

07.0 SET UP AND OPERATE POWER SAWS--The student will be able to:

07.01 Remove and replace saw blades.
07.02 Select appropriate blades to perform given sawing operations.
07.03 Select and set speeds and feeds for given sawing operations.
07.04 Measure and cut off material using a power saw.
07.05 Saw to scribed lines by using a metal band saw.
07.06 Cut and weld band saw blades to insert for contour sawing.
07.07 Set up and operate saws for angular cutting.

08.0 SET UP AND OPERATE PEDESTAL GRINDERS--The student will be able to:

08.01 Comply with safe and efficient practices.
08.02 Identify the parts of the machine and explain their use.
08.03 Set up support rests.
08.04 Dress grinding wheels.
08.05 Grind lathe tools to required angles.
08.06 Sharpen drills.

09.0 SET UP AND OPERATE DRILL PRESSES--The student will be able to:

09.01 Identify the parts of the machine and explain their use.
09.02 Identify and set the machine controls.
09.03 Comply with safe and efficient work practices.
09.04 Select the proper tooling.
09.05 Set up and operate for hole work, center drill, drill, ream, countersink, counterbore and power tapping.
09.06 Set drill presses for proper feed and speed for specified operations.

10.0 SET UP AND OPERATE LATHES--The student will be able to:

10.01 Identify the parts of the machine and explain their use.
10.02 Comply with general safe and efficient work practices.
10.03 Measure stock.
10.04 Set up an engine lathe.
10.05 Secure tools, tool holders and fixtures or attachments.
10.06 Select and set feeds and speeds.
10.07 Set up lathes and face workpieces held in chucks.
10.08 Rough cut and finish cut with lathes.
10.09 Perform lathe filing to deburr parts.
10.10 Align lathe centers using accurate methods.
10.11 Drill holes with lathes.
10.12 Countersink holes with lathes.
10.13 Ream holes with lathes.
10.14 Tap threads with lathes.
10.15 Die cut threads with lathes.
10.16 Counterbore holes with lathes.
10.17 Bore holes with lathes.
10.18 Knurl parts with lathes.
10.19 Cut external threads with lathes.
10.20 Rechase threads with lathes.
10.21 Cut internal threads with lathes.
10.22 Set up and perform taper turning with taper attachments.
10.23 Set up and perform taper turning with the compound.
10.24 Cut internal tapered surfaces.
10.25 Set up and operate tool post grinders.
10.26 Perform contour, angular or radii cuts with lathes.
10.27 Set up and use follow- and steady rests.
10.28 Set up face plates and dogs.

11.0 SET UP AND OPERATE MILLING MACHINES--The student will be able to:

11.01 Identify the parts of the horizontal and vertical machine and explain their use.
11.02 Comply with safe and efficient work practices.
11.03 True up the head and align milling machine fixtures.
11.04 Select and set feeds and speeds for milling work.
11.05 Square up workpieces with a table vise.
11.06 Perform end milling.
11.07 Perform fly cutting operations.
11.08 Drill holes with milling machines.
11.09 Perform reaming operations.
11.10 Cut external keyways.
11.11 Bore holes with milling machines.
11.12 Perform form milling.
11.13 Perform indexing operations using a dividing head.
11.14 Set up and operate rotary tables.
11.15 Mill cylindrical work.
11.16 Mill an external radius.
11.17 Mill an angle.
11.18 Align milling machine attachments.
11.19 Mill internal lots with a slotter and attachment.

11.20 Perform cutting off operations.
11.21 Set up and perform slab mill operations.
11.22 Use an edge finder and wiggler.
11.23 Use digital readouts.
11.24 Perform straddle milling operations on the horizontal mill:

12.0 SET UP AND OPERATE GRINDING MACHINES--the student will be able to:

12.01 Identify the parts of the machine and explain their use.
12.02 Comply with safe and efficient work practices.
12.03 Select the proper wheel.
12.04 Inspect, balance, dress and true grinding wheels.
12.05 Attach and align workpieces for grinding operations.
12.06 Set up and grind parallel flat surfaces.
12.07 Set up and grind four sides square.
12.08 Select and set feeds and speeds of power-feed grinders.
12.09 Cut off or part workpieces with grinding machines.
12.10 Set up and use angle plates.
12.11 Set up grinders to run workpieces between centers.
12.12 Measure, inspect and rework workpieces on grinding machines.
12.13 Set up, grind and sharpen preshaped lathe tools.
12.14 Set up and use radius dressers.
12.15 Operate cylindrical grinders.
12.16 Grind to a shoulder.
12.17 Grind a taper
12.18 Set up and operate I/O grinders (optional).

13.0 SET UP AND OPERATE TOOL MACHINES AND CUTTERS--The student will be able to:

13.01 Identify the parts of the machine and explain their use.
13.02 Identify and select proper machine controls.
13.03 Comply with safe and efficient work practices.
13.04 Select proper work holding devices.
13.05 Perform truing, dressing and forming operations to blueprint specifications.
13.06 Compute proper speeds.
13.07 Sharpen an end mill.
13.08 Sharpen a horizontal milling cutter.

14.0 APPLY COMPUTERIZED NUMERICAL CONTROL OPERATIONS SKILLS--The student will be able to:

14.01 Identify the parts of the machine and explain their use.
14.02 Identify and select proper machine controls.
14.03 Comply with safe and efficient work practices.
14.04 Write a basic program and apply basic programming skills.
14.05 Select proper work holders.
14.06 Select proper cutting tools.
14.07 Machine parts to blueprint tolerances.

15.0 SET UP AND OPERATE EDM MACHINES--The student will be able to:

15.01 Identify the parts of the machine and explain their use.
15.02 Identify and select proper machine controls.
15.03 Comply with safe and efficient work practices.
15.04 Select proper work holding devices.
15.05 Select and use proper power supply settings.
15.06 Select and use the proper electrode material and dielectric fluid.
15.07 Calculate the proper electrode size for the operation to be performed.

16.0 SET UP AND OPERATE HEAT TREAT FURNACES--The student will be able to:

- 16.01 Identify the parts of the machine and explain their use.
- 16.02 Identify and select proper machine controls.
- 16.03 Comply with safe and efficient work practices.
- 16.04 Select and identify proper heat treatment processes.
- 16.05 Perform a basic heat treatment process to blueprint specifications.

17.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 17.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 17.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 17.03 Read and follow written and oral instructions.
- 17.04 Answer and ask questions coherently and concisely.
- 17.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 17.06 Demonstrate appropriate telephone/communication skills.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

- 18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
- 18.02 Draw conclusions or make inferences from data.
- 18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
- 18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 19.01 Conduct a job search.
- 19.02 Secure information about a job.
- 19.03 Identify documents that may be required when applying for a job.
- 19.04 Complete a job application form correctly.
- 19.05 Demonstrate competence in job interview techniques.
- 19.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
- 19.07 Identify acceptable work habits.
- 19.08 Demonstrate knowledge of how to make job changes appropriately.
- 19.09 Demonstrate acceptable employee health habits.
- 19.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 20.01 Define entrepreneurship.
- 20.02 Describe the importance of entrepreneurship to the American economy.
- 20.03 List the advantages and disadvantages of business ownership.
- 20.04 Identify the risks involved in ownership of a business.
- 20.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 20.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Major Appliance and Refrigeration Repair

CODE NUMBER: Secondary ___ Postsecondary I470106

Florida CIP 0647.010600

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: APPLI REPR @ 7 G
GAS FITTER @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an electric home appliance technician (85711648), electrical appliance servicer (827.261-010), or appliance service representative (827.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, electrical and refrigeration skills, analyzing, diagnosing and repairing washers, dryers, dishwashers, trash compactors, ranges, refrigerators, freezers, microwave ovens, and window air conditioners.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in fundamentals of electricity and refrigeration, identifying, analyzing, and diagnosing gas and electric appliance system problems, disassembling and reassembling appliances, and servicing appliances.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic appliance repair skills.
02. Apply basic electrical skills.
03. Apply basic refrigeration skills.
04. Perform major appliance repair work.
05. Perform window air-conditioner repair work.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　SECONDARY NUMBER: ________

PROGRAM TITLE: Major Appliance and Refrigeration Repair　　POSTSECONDARY NUMBER: I470106

01.0 APPLY BASIC APPLIANCE REPAIR SKILLS--The student will be able to:

01.01 Apply communications and leadership techniques.
01.02 Apply human relations skills.
01.03 Apply basic math skills.
01.04 Identify safety practices.
01.05 Identify hand, power, and special tools.
01.06 Identify tubing, pipe, and fittings.
01.07 Apply soldering and brazing techniques.

02.0 APPLY BASIC ELECTRICAL SKILLS--The student will be able to:

02.01 Identify nature of electricity.
02.02 Identify magnetism and electromagnetism induction.
02.03 Identify electrical diagrams, symbols, and components.
02.04 Identify electrical codes and safety procedures.
02.05 Apply basic electrical theory and calculations.
02.06 Measure electrical values.
02.07 Compare alternating to direct current.
02.08 Test electrical components.
02.09 Test single and three phase motors.
02.10 Test capacitors.
02.11 Identify solid state components.
02.12 Trouble diagnose electrical circuits.

03.0 APPLY BASIC REFRIGERATION SKILLS--The student will be able to:

03.01 Identify basic refrigeration fundamentals.
03.02 Identify basic refrigeration cycle.
03.03 Compare refrigerants and their characteristics.
03.04 Identify refrigerant safety procedures.
03.05 Analyze refrigeration systems.
03.06 Apply dehydration and charging procedures.
03.07 Locate and repair refrigeration system leaks.
03.08 Trouble diagnose refrigeration systems.

04.0 PERFORM MAJOR APPLIANCE REPAIR WORK--The student will be able to:

04.01 Analyze appliance mechanical systems.
04.02 Analyze water pumping systems.
04.03 Test electrical systems components.
04.04 Install and repair washer system-single direction.
04.05 Install and repair single speed reversible washer.
04.06 Install and repair two-speed reversible washer.
04.07 Install and repair dryer system-minute timer.
04.08 Install and repair halo heat dryer system.
04.09 Install and repair front drum slides.
04.10 Install and repair gas dryer-automatic igniting.
04.11 Install and repair gas dryers-constant pilot.
04.12 Install and repair dishwasher power module.
04.13 Install and repair dishwasher reverse and single direction motors.
04.14 Install and repair jackscrew and scissors run trash compactor.
04.15 Install and repair garbage disposal.
04.16 Install and repair free standing electric range.

04.17 Install and repair self-cleaning electric range.
04.18 Install and repair gas range.
04.19 Analyze and repair range door lock devices.
04.20 Repair mechanical and digital timers in microwave ovens.
04.21 Test high and low microwave voltage system.
04.22 Install and repair manual defrost and no-frost refrigerators.
04.23 Analyze cabinet components of refrigerator.
04.24 Install ice maker.
04.25 Install and repair freezer.

05.0 PERFORM WINDOW AIR-CONDITIONER REPAIR WORK--The student will be able to:

05.01 Analyze and test 120 volt electrical system.
05.02 Analyze and test 230 volt electrical system.
05.03 Replace freon.
05.04 Check system pressure.
05.05 Analyze and check reverse air system.
05.06 Replace system components.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
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09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.

09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Manufacturing Technology

CODE NUMBER: Secondary ______ Postsecondary _________

Florida CIP 0615.060302

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

__x__ Postsecondary Vocational ______ Other ___________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an industrial engineering technician (22508226), or production planner (012.167-050), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and a combination of theory and laboratory activities to gain the necessary cognitive and manipulative skills to analyze data, make resource utilization decisions and manage a manufacturing oriented facility.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in computer control, technical communications, maintenance of electromechanical components, quality control, material handling, and time and motion studies.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01. Plan and schedule production processing and material utilization.
02. Develop employee job standards and conduct time and motion and cost control studies.
03. Perform purchasing and resource identification activities.
04. Perform computer control functions.
05. Plan, develop and implement communication processes.
06. Maintain electromechanical components.
07. Develop and implement processes for material handling and quality control and reliability.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ______

PROGRAM TITLE: Manufacturing Technology POSTSECONDARY NUMBER: ______

01.0 PLAN AND SCHEDULE PRODUCTION PROCESSING AND MATERIAL UTILIZATION--The student will be able to:

01.01 Schedule jobs.
01.02 Requisition materials.
01.03 Organize assembly lines.
01.04 Assign personnel to equipment and positions.
01.05 Control shop flow of jobs.
01.06 Conduct in-process inspectors.
01.07 Direct assembly of components into final products.
01.08 Conduct final test and inspection.
01.09 Direct packaging.
01.10 Direct shipping or transfer to customer or warehouse.

02.0 DEVELOP EMPLOYEE JOB STANDARDS AND CONDUCT TIME AND MOTION AND COST CONTROL STUDIES--The student will be able to:

02.01 Conduct time and motion studies.
02.02 Establish and write employee job standards.
02.03 Develop cost central data.
02.04 Analyze cost central reports.
02.05 Analyze production methods and processes.
02.06 Analyze and integrate processes into total systems.
02.07 Write job descriptions.
02.08 Complete job status reports.
02.09 Analyze job evaluation.

03.0 PERFORM PURCHASING AND RESOURCE IDENTIFICATION ACTIVITIES--The student will be able to:

03.01 Advise on "make or buy" decisions.
03.02 Identify services of supply.
03.03 Obtain bids or quotations.
03.04 Select vendor.
03.05 Prepare and issue purchase requisition.
03.06 Receive and inspect incoming materials.
03.07 Average distribution of materials.

04.0 PERFORM COMPUTER CONTROL FUNCTIONS--The student will be able to:

04.01 Make computer application analysis.
04.02 Process CAD/CAM program.
04.03 Write a program.
04.04 Program micro-processors.
04.05 Make adjustments to programs.
04.06 Evaluate robotic applications.

05.0 PLAN, DEVELOP, AND IMPLEMENT COMMUNICATION PROCESSES--The student will be able to:

05.01 Write production reports.
05.02 Write technical reports.
05.03 Illustrate report with charts, diagrams and graphs.
05.04 Prepare and deliver report.
05.05 Plan technical training for employees.

06.0 MAINTAIN ELECTROMECHANICAL COMPONENTS--The student will be able to:

06.01 Interpret blue prints, schematics, and technical manuals.
06.02 Establish operating maintenance schedule.
06.03 Analyze system failures.
06.04 Make minor repairs in equipment.
06.05 Coordinate maintenance services.
06.06 Evaluate need for equipment replacement.

07.0 DEVELOP AND IMPLEMENT PROCESSES FOR MATERIAL HANDLING AND QUALITY CONTROL AND RELIABILITY--The student will be able to:

07.01 Establish system for handling and storing material in process.
07.02 Establish a system for handling and storing finished material.
07.03 Develop quality control.
07.04 Prepare deviations from specifications evaluation.
07.05 Investigate equipment failures.
07.06 Conduct quality tests under varying environmental conditions.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Manufacturing Technology POSTSECONDARY NUMBER: _______

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01.09 Direct packaging.
01.10 Direct shipping or transfer to customer or warehouse.

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03.04 Select vendor.
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03.07 Average distribution of materials.

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04.03 Write a program.
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04.05 Make adjustments to programs.
04.06 Evaluate robotic applications.

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05.02 Write technical reports.
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05.04 Prepare and deliver report.
05.05 Plan technical training for employees.

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07.04 Prepare deviations from specifications evaluation.
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09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job

interview.

11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Marine Mechanics

CODE NUMBER: Secondary 8751000 Postsecondary _______

Florida CIP 0649.032600

SECONDARY
SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DESEL MECH @ 7 G GASENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinery mechanics; marine engines (85116617), or outboard motor mechanics (625.131-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: service and repair of electrical, mechanical, power transfer, hydraulic, fuel and cooling systems; boat rigging and trailers; and preparation of sales merchandise.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8751010	Marine Mechanics 1
8751020	Marine Mechanics 2
8751030	Marine Mechanics 3
8751040	Marine Mechanics 4
8751050	Marine Mechanics 5
8751060	Marine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: tools; test equipment; current model outboard motors; inboard-outdrive motors; location and installation of accessories; boat trailers; and operational testing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for

each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student"s individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform shop practices to industry standards.
02. Maintain and repair basic four-stroke cycle engines.
03. Maintain and repair basic two-stroke cycle engines.
04. Maintain and repair electrical systems.
05. Maintain and repair cranking systems.
06. Maintain and repair magneto ignition systems.
07. Maintain and repair battery ignition systems.
08. Maintain and repair capacitor discharge ignition systems.
09. Maintain and repair outboard charging systems.
10. Maintain and repair fuel systems.
11. Maintain and repair two-stroke cycle carburetors.
12. Maintain and repair inboard gas systems.
13. Maintain and repair cooling systems.
14. Maintain and repair lubrication systems.
15. Maintain and repair intermediate housings.
16. Maintain and repair stern drive upper gear case.
17. Perform upper to lower gear case maintenance.
18. Maintain and repair lower gear cases.
19. Maintain and repair transmissions.
20. Assemble and maintain outboard lower units and housing assemblies.
21. Use marine woods, metals and fiberglass.
22. Adjust and repair trailers.
23. Prepare and deliver sales merchandise.
24. Demonstrate appropriate communication skills.
25. Demonstrate appropriate math skills.
26. Demonstrate appropriate understanding of basic science.
27. Demonstrate employability skills.
28. Demonstrate and understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8751000

PROGRAM TITLE: Marine Mechanics POSTSECONDARY NUMBER: _______

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations.
01.02 Use hand tools safely and properly.
01.03 Set up and use power tools safely and properly.
01.04 Set up and use precision measuring tools.
01.05 Drill and remove broken studs and install helicoils.
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.07 Identify and make gaskets and seals.
01.08 Read and use parts manuals.
01.09 Read, interpret and apply service manuals.
01.10 Locate and match electrical units by their symbols on a wiring diagram.

02.0 MAINTAIN AND REPAIR BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

02.01 Explain the basic principles of the operation of four-stroke cycle internal combustion engines.
02.02 Identify types of four-stroke cycle engines.
02.03 Locate engine serial and model numbers.
02.04 Identify engine assemblies and systems.
02.05 Diagnose valve and head problems by use of the visual inspection method.
02.06 Diagnose valve and head problems by use of the compression tester method.
02.07 Diagnose valve and head problems by use of the cylinder air pressure method.
02.08 Disassemble engines and inspect parts.
02.09 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
02.10 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
02.11 Grind valve seats and reface valves.
02.12 Check and inspect springs for free height, distortion and installed height.
02.13 Adjust valve lash.
02.14 Move and inspect camshafts and lifters.
02.15 Measure camshafts.
02.16 Clean and inspect lifters for wear.
02.17 Time valve drive assemblies.
02.18 Remove pistons from rod assemblies.
02.19 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
02.20 Check piston pins and bosses for wear.
02.21 Measure piston ring lands width, out-of-round and taper.
02.22 Measure the piston ring gap in cylinder bores.
02.23 Install and fit piston pins.
02.24 Check rod and piston assembly alignment.
02.25 Remove and replace rod bearings.
02.26 Hone and clean cylinders.
02.27 Install rings on pistons.
02.28 Measure and check crankshafts with a micrometer.
02.29 Check for end play.

02.30 Check bearing bores with a telescoping gage.
02.31 Reassemble engines.
02.32 Install oil seals.

03.0 MAINTAIN AND REPAIR BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

03.01 Explain the basic principles of the operation of two-stroke cycle internal combustion engines
03.02 Identify types of engines.
03.03 Locate engine serial and model numbers.
03.04 Identify engine assemblies and systems.
03.05 Disassemble engines.
03.06 Remove, clean and inspect heads for cracks, warpage and damaged spark plug threads.
03.07 Diagnose had problems by use of the visual inspection method.
03.08 Diagnose head problems by use of the compression tester method.
03.09 Diagnose head problems by use of cylinder air pressure method.
03.10 Diagnose head problems by use of the stethoscope method.
03.11 Remove, clean and inspect piston rods and assemblies.
03.12 Measure out-of-round of pistons and cylinders.
03.13 Hone cylinders.
03.14 Check the total bearing surface of connecting rod bearings.
03.15 Measure piston skirts and ring grooves.
03.16 Measure the piston ring gap in cylinder bores.
03.17 Install piston pins according to manufacturer's specifications.
03.18 Check rod and piston assembly alignment.
03.19 Install rings on pistons.
03.20 Install piston rod assemblies.
03.21 Measure and check crankshafts with a micrometer.
03.22 Check needle bearings.
03.23 Inspect crankshafts and install seal.
03.24 Inspect, clean and/or replace reed valves.
03.25 Reassemble engines.

04.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

04.01 Set up and use voltmeters, ammeters and ohmmeters.
04.02 Locate and identify electrical circuit components.
04.03 Sketch a typical circuit using a single wire system.
04.04 Test storage batteries using a hydrometer.
04.05 Test storage batteries using a light and load test.
04.06 Charge storage batteries.
04.07 Remove and replace batteries and service battery boxes.
04.08 Repair damaged wire and electrical harnesses.
04.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop.
04.10 Sketch and label typical fuel gage systems.
04.11 Remove and replace ammeters or indicating lights.
04.12 Remove and replace fuel gages.
04.13 Remove and replace fuel sending units.
04.14 Diagnose gages and accessory system troubles using test lights, voltmeters, ammeters or detached sending units.
04.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights.
04.16 Locate opens, shorts and grounds.

05.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:

05.01 Disassemble recoil starters.
05.02 Inspect components of recoil starters.
05.03 Reassemble recoil starters.

05.04 Identify components of electrical starting systems.
05.05 Disassemble different types of starting motors.
05.06 Bench test armatures.
05.07 Bench test field coils.
05.08 Bench test drive units.
05.09 Bench test switches.
05.10 Bench test minor parts of starting motor components.
05.11 Use armature lathes for turning commutators.
05.12 Install, reassemble and test new starter parts.
05.13 Troubleshoot starting systems using battery starter testers.
05.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop.
05.15 Recondition solenoids, drives and other components.
05.16 Set up and use battery starter (load) testers.
05.17 Locate opens, shorts and grounds.

06.0 MAINTAIN AND REPAIR MAGNETO IGNITION SYSTEMS--The student will be able to:

06.01 Sketch and label electrical symbols.
06.02 Set up and use ohmmeters.
06.03 Set up and use voltmeters.
06.04 Set up and use ignition testers.
06.05 Set up and use ignition analyzers.
06.06 Locate and identify parts of magneto ignitions.
06.07 Locate and match electrical units by their symbols on a wiring diagram.
06.08 Sketch and label complete magneto ignition systems.
06.09 Check coil resistance with an ohmmeter.
06.10 Check points for continuity and resistance.
06.11 Check condensers for capacity, leaks and shorts.
06.12 Clean and regap spark plugs.

07.0 MAINTAIN AND REPAIR BATTERY IGNITION SYSTEMS--The student will be able to:

07.01 Locate and identify parts of battery ignition systems.
07.02 Locate and match electrical units by their symbols on a wiring diagram.
07.03 Sketch and label complete battery ignition systems.
07.04 Check coil resistance with an ohmmeter.
07.05 Check points for continuity and resistance.
07.06 Check condensers for capacity, leaks and shorts.
07.07 Set up and use test equipment.
07.08 Set timing using a timing light.

08.0 MAINTAIN AND REPAIR CAPACITOR DISCHARGE IGNITION SYSTEMS--The student will be able to:

08.01 Sketch and label electrical symbols.
08.02 Set up and use ohmmeters.
08.03 Set up and use a CD-77
08.04 Set up and use spark testers.
08.05 Set up and use neon test lights.
08.06 Set up and use low/high ammeters.
08.07 Set up and use voltmeters.
08.08 Locate and identify parts of capacitor discharge ignition systems.
08.09 Locate and match electrical units by their symbols on a wiring diagram.
08.10 Sketch and label complete C/D ignition systems.
08.11 Check coil resistance, shorts and grounds with an ohmmeter.
08.12 Check stator windings with an ohmmeter.

08.13 Check sensor coils, charge coils, ignition coils and shorts to ground with a CD-77.
08.14 Check power packs with an ohmmeter and a CD-77.

09.0 MAINTAIN AND REPAIR OUTBOARD CHARGING SYSTEMS--The student will be able to:

09.01 Sketch and label the units of complete charging circuits.
09.02 Disassemble charging systems and identify the components.
09.03 Perform stator and rectifier testing on charging systems.
09.04 Reassemble and test charging systems.
09.05 Set up and use ohmmeters.
09.06 Test regulators.
09.07 Reassemble and test complete units.

10.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

10.01 Identify and locate fuel system components (fuel tanks, lines, filters, etc.).
10.02 Sketch and label the parts of total fuel systems.
10.03 Service fuel lines.
10.04 Remove, clean and install fuel tanks.
10.05 Identify and locate fuel pump vacuums.
10.06 Remove, replace service and check the pressure of fuel pumps.
10.07 Remove, clean and replace in-line filters.
10.08 Identify the major types of carburetors.
10.09 Check and adjust throttle and governor linkages.

11.0 MAINTAIN AND REPAIR TWO-STROKE CYCLE CARBURETORS--The student will be able to:

11.01 Sketch and label the parts of total fuel systems.
11.02 Service fuel lines and primer bulbs (vacuum test).
11.03 Remove, clean, inspect and install fuel tanks.
11.04 Identify basic carburetor circuits (chokes, floats, fuel inlets; idle, intermediate and high speeds; mains, etc.)
11.05 Identify and locate fuel pumps.
11.06 Remove, inspect and replace fuel pumps.
11.07 Remove, clean, overhaul, replace and make final adjustments to carburetors.
11.08 Remove, service and replace air cleaners.
11.09 Diagnose carburetor problems.
11.10 Remove, inspect and replace reed valves and gaskets.
11.11 Diagnose exhaust problems such as back pressure and scavenging.
11.12 Inspect and service oil metering systems.
11.13 Determine and make appropriate fuel-oil mixtures.

12.0 MAINTAIN AND REPAIR INBOARD GAS SYSTEMS--The student will be able to:

12.01 Remove, service and replace carburetor air cleaners/flame arrestors.
12.02 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages and intake manifolds).
12.03 Remove, clean, overhaul, replace and make final adjustments to carburetors.

13.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

13.01 Explain the principles of cooling systems, including fresh water cooling systems.
13.02 Trace water flow through cooling systems.
13.03 Disassemble and reassemble water pumps.

13.04 Remove, check and replace thermostats.
13.05 Use thermostat pressure relief systems.
13.06 Service manifolds, risers and thermostat housings.
13.07 Service water cooling systems for gas inboard, gas outboard and diesel engines.

14.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

14.01 Identify the types and functions of lubrication systems.
14.02 Explain the principles of lubrication systems.
14.03 Identify and locate components of lubrication systems.
14.04 Check engines for oil leaks.
14.05 Change engine oil and filters.
14.06 Check engine oil pressure and level.
14.07 Recognize and use only recommended oil.

15.0 MAINTAIN AND REPAIR INTERMEDIATE HOUSINGS--The student will be able to:

15.01 Disassemble main drive shafts.
15.02 Shim drive shafts to intermediate housings.
15.03 Remove and replace clutch assemblies.
15.04 Check electrical components with proper test equipment.
15.05 Remove and replace "U" joints.
15.06 Disassemble outer transom plates.
15.07 Adjust trim and limit switches.
15.08 Disassemble cylinder rams.

16.0 MAINTAIN AND REPAIR STERN DRIVE UPPER GEAR CASE--The student will be able to:

16.01 Determine the differences between mechanical, electrical and hydraulic shifting units.
16.02 Disassemble and reassemble each type of shifting unit.
16.03 Reshim units to manufacturers' specifications.
16.04 Use the proper oil to refill upper and lower gear cases.

17.0 PERFORM UPPER TO LOWER GEAR CASE MAINTENANCE--The student will be able to:

17.01 Disassemble exhaust housings.
17.02 Inspect seals, "O" rings, shafts and bearings.
17.03 Reassemble exhaust housings.

18.0 MAINTAIN AND REPAIR LOWER GEAR CASES--The student will be able to:

18.01 Determine the differences between mechanical, electrical and hydraulic shifting.
18.02 Remove and replace lower gear cases.
18.03 Reshim lower gear cases.
18.04 Refill lower gear cases with specified oil.
18.05 Determine propeller pitch, diameter and hub type.

19.0 MAINTAIN AND REPAIR TRANSMISSIONS--The student will be able to:

19.01 Inspect planetary clutch plate air coupling assemblies
19.02 Remove and replace transmissions.
19.03 Use proper service tools in shimming, reassembly and testing.
19.04 Drain transmissions.
19.05 Determine capacity using the transmission service manuals.
19.06 Refill transmissions according to manufacturers' specifications.

20.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES--The

student will be able to:

20.01 Disassemble and reassemble steering handle groups.
20.02 Disassemble and assemble exhaust housings and water tube assemblies.
20.03 Replace motor mounts and shock absorbers.
20.04 Lubricate all fittings.
20.05 Pressure and vacuum test gear cases.
20.06 Remove and test cylinders and rams.
20.07 Adjust reverse locks.
20.08 Adjust the trim and tilt.
20.09 Determine the differences between mechanical, electrical and hydraulic shifting units.
20.10 Explain the shifting theory of the lower unit.
20.11 Disassemble and reassemble mechanical shifting units.
20.12 Disassemble and reassemble electrical shifting units.
20.13 Disassemble and reassemble hydraulic shifting units.
20.14 Inspect all parts for wear.

21.0 USE MARINE WOODS, METALS, AND FIBERGLASS--The student will be able to:

21.01 Explain the hazards of a marine environment to woods, metals and fiberglass.
21.02 Explain a galvanic series.
21.03 Explain the theory for using given materials in boat repair activities.

22.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

22.01 Make boat to trailer adjustments.
22.02 Remove and replace lighting systems.
22.03 Remove and replace wheel bearings and springs.
22.04 Remove and replace brakes.
22.05 Disassemble, diagnose and reassemble trim and tilt systems.
22.06 Remove and test cylinder rams.
22.07 Adjust reverse locks.
22.08 Adjust the trim and tilt.

23.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

23.01 Make center line measurements for outboard motor installation.
23.02 Center the plate height.
23.03 Locate manufacturers' I.D. plates.
23.04 Mount control boxes at the helm.
23.05 Place wiring and cables in a neat and orderly manner.
23.06 Adjust the control cables from the engine to the control box.
23.07 Center the steering cable to the engine.
23.08 Find suitable locations for accessories and mount them to the boat.
23.09 Lubricate shafts, install propellers and fasten both securely.
23.10 Check for proper levels.
23.11 Check manufacturers' specifications.
23.12 Test-run boats.
23.13 Recheck work completed.
23.14 Check manufacturers' installation procedures for stern drive units.
23.15 Lubricate shafts and install propellers securely.
23.16 Obtain maximum oil level capacity.
23.17 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc.
23.18 Find a suitable mount location and mount the engine securely in the boat.

23.19 Set engines to manufacturers' specifications.
23.20 Set, adjust and test engines to manufacturers' specifications.
23.21 Remove and replace running lights.
23.22 Troubleshoot lighting systems and accessories.
23.23 Check and adjust throttles, cables, horns, lights and tachometers.

24.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

24.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
24.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
24.03 Read and follow written and oral instructions.
24.04 Answer and ask questions coherently and concisely.
24.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
24.06 Demonstrate appropriate telephone/communication skills.

25.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

25.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
25.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
25.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
25.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
25.05 Demonstrate an understanding of federal, state and local taxes and their computation.

26.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

26.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
26.02 Draw conclusions or make inferences from data.
26.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
26.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

27.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

27.01 Conduct a job search.
27.02 Secure information about a job.
27.03 Identify documents that may be required when applying for a job.
27.04 Complete a job application form correctly.
27.05 Demonstrate competence in job interview techniques.
27.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
27.07 Identify acceptable work habits.
27.08 Demonstrate knowledge of how to make appropriate job changes.
27.09 Demonstrate acceptable employee health habits.
27.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

28.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able

to:

28.01 Define entrepreneurship.
28.02 Describe the importance of entrepreneurship to the American economy.
28.03 List the advantages and disadvantages of business ownership.
28.04 Identify the risks involved in ownership of a business.
28.05 Identify the necessary personal characteristics of a successful entrepreneur.
28.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Marine Mechanics PROGRAM NUMBER: 8751000

COURSE TITLE: Marine Mechanics 1 COURSE NUMBER: 8751010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing shop practices to industry standards and employability skills.

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations.
01.02 Use hand tools safely and properly.
01.03 Set up and use power tools safely and properly.
01.04 Set up and use precision measuring tools.
01.05 Drill and remove broken studs and install helicoils.
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.07 Identify and make gaskets and seals.
01.08 Read and use parts manuals.
01.09 Read, interpret and apply service manuals.
01.10 Locate and match electrical units by their symbols on a wiring diagram.

27.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

27.01 Conduct a job search.
27.02 Secure information about a job.
27.03 Identify documents that may be required when applying for a job.
27.04 Complete a job application form correctly.
27.05 Demonstrate competence in job interview techniques.
27.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
27.07 Identify acceptable work habits.
27.08 Demonstrate knowledge of how to make appropriate job changes.
27.09 Demonstrate acceptable employee health habits.
27.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Marine Mechanics PROGRAM NUMBER: 8751000

COURSE TITLE: Marine Mechanics 2 COURSE NUMBER: 8751020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing basic four-stroke cycle engines and two-stroke cycle engines.

02.0 MAINTAIN AND REPAIR BASIC FOUR-STROKE CYCLE ENGINES--The student will be

able to:

02.01 Explain the basic principles of the operation of four-stroke cycle internal combustion engines.
02.02 Identify types of four-stroke cycle engines.
02.03 Locate engine serial and model numbers.
02.04 Identify engine assemblies and systems.
02.05 Diagnose valve and head problems by use of the visual inspection method.
02.06 Diagnose valve and head problems by use of the compression tester method.
02.07 Diagnose valve and head problems by use of the cylinder air pressure method.
02.08 Disassemble engines and inspect parts.
02.09 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
02.10 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
02.11 Grind valve seats and reface valves.
02.12 Check and inspect springs for free height, distortion and installed height.
02.13 Adjust valve lash.
02.14 Move and inspect camshafts and lifters.
02.15 Measure camshafts.
02.16 Clean and inspect lifters for wear.
02.17 Time valve drive assemblies.
02.18 Remove pistons from rod assemblies.
02.19 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
02.20 Check piston pins and bosses for wear.
02.21 Measure piston ring lands width, out-of-round and taper.
02.22 Measure the piston ring gap in cylinder bores.
02.23 Install and fit piston pins.
02.24 Check rod and piston assembly alignment.
02.25 Remove and replace rod bearings.
02.26 Hone and clean cylinders.
02.27 Install rings on pistons.
02.28 Measure and check crankshafts with a micrometer.
02.29 Check for end play.
02.30 Check bearing bores with a telescoping gage.
02.31 Reassemble engines.
02.32 Install oil seals.

03.0 MAINTAIN AND REPAIR BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

03.01 Explain the basic principles of the operation of two-stroke cycle internal combustion engines.
03.02 Identify types of engines.
03.03 Locate engine serial and model numbers.
03.04 Identify engine assemblies and systems.
03.05 Disassemble engines.
03.06 Remove, clean and inspect heads for cracks, warpage and damaged spark plug threads.
03.07 Diagnose had problems by use of the visual inspection method.
03.08 Diagnose head problems by use of the compression tester method.
03.09 Diagnose head problems by use of cylinder air pressure method.
03.10 Diagnose head problems by use of the stethoscope method.
03.11 Remove, clean and inspect piston rods and assemblies.
03.12 Measure out-of-round of pistons and cylinders.
03.13 Hone cylinders.
03.14 Check the total bearing surface of connecting rod bearings.

03.15 Measure piston skirts and ring grooves.
03.16 Measure the piston ring gap in cylinder bores.
03.17 Install piston pins according to manufacturer's specifications.
03.18 Check rod and piston assembly alignment.
03.19 Install rings on pistons.
03.20 Install piston rod assemblies.
03.21 Measure and check crankshafts with a micrometer.
03.22 Check needle bearings.
03.23 Inspect crankshafts and install seal.
03.24 Inspect, clean and/or replace reed valves.
03.25 Reassemble engines.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Marine Mechanics

PROGRAM NUMBER: 8751000

COURSE TITLE: Marine Mechanics 3

COURSE NUMBER: 8751030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing electrical systems, cranking systems and ignition systems.

04.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

04.01 Set up and use voltmeters, ammeters and ohmmeters.
04.02 Locate and identify electrical circuit components.
04.03 Sketch a typical circuit using a single wire system.
04.04 Test storage batteries using a hydrometer.
04.05 Test storage batteries using a light and load test.
04.06 Charge storage batteries.
04.07 Remove and replace batteries and service battery boxes.
04.08 Repair damaged wire and electrical harnesses.
04.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop.
04.10 Sketch and label typical fuel gage systems.
04.11 Remove and replace ammeters or indicating lights.
04.12 Remove and replace fuel gages.
04.13 Remove and replace fuel sending units.
04.14 Diagnose gages and accessory system troubles using test lights, voltmeters, ammeters or detached sending units.
04.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights.
04.16 Locate opens, shorts and grounds.

05.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:

05.01 Disassemble recoil starters.
05.02 Inspect components of recoil starters.
05.03 Reassemble recoil starters.
05.04 Identify components of electrical starting systems.
05.05 Disassemble different types of starting motors.
05.06 Bench test armatures.
05.07 Bench test field coils.
05.08 Bench test drive units.
05.09 Bench test switches.

05.10 Bench test minor parts of starting motor components.
05.11 Use armature lathes for turning commutators.
05.12 Install, reassemble and test new starter parts.
05.13 Troubleshoot starting systems using battery starter testers.
05.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop.
05.15 Recondition solenoids, drives and other components.
05.16 Set up and use battery starter (load) testers.
05.17 Locate opens, shorts and grounds.

06.0 MAINTAIN AND REPAIR MAGNETO IGNITION SYSTEMS--The student will be able to:

06.01 Sketch and label electrical symbols.
06.02 Set up and use ohmmeters.
06.03 Set up and use voltmeters.
06.04 Set up and use ignition testers.
06.05 Set up and use ignition analyzers.
06.06 Locate and identify parts of magneto ignitions.
06.07 Locate and match electrical units by their symbols on a wiring diagram.
06.08 Sketch and label complete magneto ignition systems.
06.09 Check coil resistance with an ohmmeter.
06.10 Check points for continuity and resistance.
06.11 Check condensers for capacity, leaks and shorts.
06.12 Clean and regap spark plugs.

07.0 MAINTAIN AND REPAIR BATTERY IGNITION SYSTEMS--The student will be able to:

07.01 Locate and identify parts of battery ignition systems.
07.02 Locate and match electrical units by their symbols on a wiring diagram.
07.03 Sketch and label complete battery ignition systems.
07.04 Check coil resistance with an ohmmeter.
07.05 Check points for continuity and resistance.
07.06 Check condensers for capacity, leaks and shorts.
07.07 Set up and use test equipment.
07.08 Set timing using a timing light.

08.0 MAINTAIN AND REPAIR CAPACITOR DISCHARGE IGNITION SYSTEMS--The student will be able to:

08.01 Sketch and label electrical symbols.
08.02 Set up and use ohmmeters.
08.03 Set up and use a CD-77
08.04 Set up and use spark testers.
08.05 Set up and use neon test lights.
08.06 Set up and use low/high ammeters.
08.07 Set up and use voltmeters.
08.08 Locate and identify parts of capacitor discharge ignition systems.
08.09 Locate and match electrical units by their symbols on a wiring diagram.
08.10 Sketch and label complete C/D ignition systems.
08.11 Check coil resistance, shorts and grounds with an ohmmeter.
08.12 Check stator windings with an ohmmeter.
08.13 Check sensor coils, charge coils, ignition coils and shorts to ground with a CD-77.
08.14 Check power packs with an ohmmeter and a CD-77.

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STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Marine Mechanics | PROGRAM NUMBER: 8751000

COURSE TITLE: Marine Mechanics 4 | COURSE NUMBER: 8751040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing outboard charging systems, fuel systems and cooling systems.

09.0 MAINTAIN AND REPAIR OUTBOARD CHARGING SYSTEMS--The student will be able to:

09.01 Sketch and label the units of complete charging circuits.
09.02 Disassemble charging systems and identify the components.
09.03 Perform stator and rectifier testing on charging systems.
09.04 Reassemble and test charging systems.
09.05 Set up and use ohmmeters.
09.06 Test regulators.
09.07 Reassemble and test complete units.

10.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

10.01 Identify and locate fuel system components (fuel tanks, lines,filters, etc.).
10.02 Sketch and label the parts of total fuel systems.
10.03 Service fuel lines.
10.04 Remove, clean and install fuel tanks.
10.05 Identify and locate fuel pump vacuums.
10.06 Remove, replace service and check the pressure of fuel pumps.
10.07 Remove, clean and replace in-line filters.
10.08 Identify the major types of carburetors.
10.09 Check and adjust throttle and governor linkages.

11.0 MAINTAIN AND REPAIR TWO-STROKE CYCLE CARBURETORS--The student will be able to:

11.01 Sketch and label the parts of total fuel systems.
11.02 Service fuel lines and primer bulbs (vacuum test).
11.03 Remove, clean, inspect and install fuel tanks.
11.04 Identify basic carburetor circuits (chokes, floats, fuel inlets; idle, intermediate and high speeds; mains, etc.)
11.05 Identify and locate fuel pumps.
11.06 Remove, inspect and replace fuel pumps.
11.07 Remove, clean, overhaul, replace and make final adjustments to carburetors.
11.08 Remove, service and replace air cleaners.
11.09 Diagnose carburetor problems.
11.10 Remove, inspect and replace reed valves and gaskets.
11.11 Diagnose exhaust problems such as back pressure and scavenging.
11.12 Inspect and service oil metering systems.
11.13 Determine and make appropriate fuel-oil mixtures.

12.0 MAINTAIN AND REPAIR INBOARD GAS SYSTEMS--The student will be able to:

12.01 Remove, service and replace carburetor air cleaners/flame arrestors.

12.02 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages and intake manifolds).
12.03 Remove, clean, overhaul, replace and make final adjustments to carburetors.

13.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

13.01 Explain the principles of cooling systems, including fresh water cooling systems.
13.02 Trace water flow through cooling systems.
13.03 Disassemble and reassemble water pumps.
13.04 Remove, check and replace thermostats.
13.05 Use thermostat pressure relief systems.
13.06 Service manifolds, risers and thermostat housings.
13.07 Service water cooling systems for gas inboard, gas outboard and diesel engines.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Marine Mechanics

PROGRAM NUMBER: 8751000

COURSE TITLE: Marine Mechanics 5

COURSE NUMBER: 8751050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing lubrication systems, outdrives, transmissions and intermediate housings, and the assembly and maintenance of outboard lower units and housing assemblies.

14.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

14.01 Identify the types and functions of lubrication systems.
14.02 Explain the principles of lubrication systems.
14.03 Identify and locate components of lubrication systems.
14.04 Check engines for oil leaks.
14.05 Change engine oil and filters.
14.06 Check engine oil pressure and level.
14.07 Recognize and use only recommended oil.

15.0 MAINTAIN AND REPAIR INTERMEDIATE HOUSINGS--The student will be able to:

15.01 Disassemble main drive shafts.
15.02 Shim drive shafts to intermediate housings.
15.03 Remove and replace clutch assemblies.
15.04 Check electrical components with proper test equipment.
15.05 Remove and replace "U" joints.
15.06 Disassemble outer transom plates.
15.07 Adjust trim and limit switches.
15.08 Disassemble cylinder rams.

16.0 MAINTAIN AND REPAIR STERN DRIVE UPPER GEAR CASE--The student will be able to:

16.01 Determine the differences between mechanical, electrical and hydraulic shifting units.
16.02 Disassemble and reassemble each type of shifting unit.

16.03 Reshim units to manufacturers' specifications.
16.04 Use the proper oil to refill upper and lower gear cases.

17.0 PERFORM UPPER TO LOWER GEAR CASE MAINTENANCE--The student will be able to:

17.01 Disassemble exhaust housings.
17.02 Inspect seals, "O" rings, shafts and bearings.
17.03 Reassemble exhaust housings.

18.0 MAINTAIN AND REPAIR LOWER GEAR CASES--The student will be able to:

18.01 Determine the differences between mechanical, electrical and hydraulic shifting.
18.02 Remove and replace lower gear cases.
18.03 Reshim lower gear cases.
18.04 Refill lower gear cases with specified oil.
18.05 Determine propeller pitch, diameter and hub type.

19.0 MAINTAIN AND REPAIR TRANSMISSIONS--The student will be able to:

19.01 Inspect planetary clutch plate air coupling assemblies
19.02 Remove and replace transmissions.
19.03 Use proper service tools in shimming, reassembly and testing.
19.04 Drain transmissions.
19.05 Determine capacity using the transmission service manuals.
19.06 Refill transmissions according to manufacturers' specifications.

20.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES--The student will be able to:

20.01 Disassemble and reassemble steering handle groups.
20.02 Disassemble and assemble exhaust housings and water tube assemblies.
20.03 Replace motor mounts and shock absorbers.
20.04 Lubricate all fittings.
20.05 Pressure and vacuum test gear cases.
20.06 Remove and test cylinders and rams.
20.07 Adjust reverse locks.
20.08 Adjust the trim and tilt.
20.09 Determine the differences between mechanical, electrical and hydraulic shifting units.
20.10 Explain the shifting theory of the lower unit.
20.11 Disassemble and reassemble mechanical shifting units.
20.12 Disassemble and reassemble electrical shifting units.
20.13 Disassemble and reassemble hydraulic shifting units.
20.14 Inspect all parts for wear.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Marine Mechanics	PROGRAM NUMBER: 8751000
COURSE TITLE: Marine Mechanics 6	COURSE NUMBER: 8751060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for proper use of marine woods, metals and fiberglass, the adjustment and repair of trailers and the proper way to prepare and deliver sales merchandise.

21.0 USE MARINE WOODS, METALS, AND FIBERGLASS--The student will be able to:

21.01 Explain the hazards of a marine environment to woods, metals and fiberglass.
21.02 Explain a galvanic series.
21.03 Explain the theory for using given materials in boat repair activities.

22.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

22.01 Make boat to trailer adjustments.
22.02 Remove and replace lighting systems.
22.03 Remove and replace wheel bearings and springs.
22.04 Remove and replace brakes.
22.05 Disassemble, diagnose and reassemble trim and tilt systems.
22.06 Remove and test cylinder rams.
22.07 Adjust reverse locks.
22.08 Adjust the trim and tilt.

23.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

23.01 Make center line measurements for outboard motor installation.
23.02 Center the plate height.
23.03 Locate manufacturers' I.D. plates.
23.04 Mount control boxes at the helm.
23.05 Place wiring and cables in a neat and orderly manner.
23.06 Adjust the control cables from the engine to the control box.
23.07 Center the steering cable to the engine.
23.08 Find suitable locations for accessories and mount them to the boat.
23.09 Lubricate shafts, install propellers and fasten both securely.
23.10 Check for proper levels.
23.11 Check manufacturers' specifications.
23.12 Test-run boats.
23.13 Recheck work completed.
23.14 Check manufacturers' installation procedures for stern drive units.
23.15 Lubricate shafts and install propellers securely.
23.16 Obtain maximum oil level capacity.
23.17 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc.
23.18 Find a suitable mount location and mount the engine securely in the boat.
23.19 Set engines to manufacturers' specifications.
23.20 Set, adjust and test engines to manufacturers' specifications.
23.21 Remove and replace running lights.
23.22 Troubleshoot lighting systems and accessories.
23.23 Check and adjust throttles, cables, horns, lights and tachometer

24.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

24.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
24.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
24.03 Read and follow written and oral instructions.

24.04 Answer and ask questions coherently and concisely.
24.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
24.06 Demonstrate appropriate telephone/communication skills.

25.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

25.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
25.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
25.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
25.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
25.05 Demonstrate an understanding of federal, state and local taxes and their computation.

26.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

26.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
26.02 Draw conclusions or make inferences from data.
26.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
26.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

28.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

28.01 Define entrepreneurship.
28.02 Describe the importance of entrepreneurship to the American economy.
28.03 List the advantages and disadvantages of business ownership.
28.04 Identify the risks involved in ownership of a business.
28.05 Identify the necessary personal characteristics of a successful entrepreneur.
28.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Marine Mechanics Technology

CODE NUMBER: Secondary _______ Postsecondary I490306

Florida CIP 0649.030600

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: DESEL MECH @ 7 G GASENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinery mechanics; marine engines (85116617), or marine engine mechanics (623.281-026). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: service, repair and overhaul of four-stroke and two-stroke cycle engines and outboard motors; and service and repair of boating accessories. With regard to the above, course content will include electrical systems, fuel systems, power transfer systems, ignition systems, cooling systems, lubrication systems, drive systems and boat and trailer rigging.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: welding procedures, current model outboard motors, inboard-outboard motors and operational testing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number

corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform shop practices to industry standards.
02. Maintain and repair basic four-stroke cycle engines.
03. Maintain and repair basic two-stroke cycle engines.
04. Maintain and repair electrical systems.
05. Maintain and repair cranking systems.
06. Maintain and repair magneto ignition systems.
07. Maintain and repair battery ignition systems.
08. Maintain and repair capacitor discharge ignition systems.
09. Maintain and repair outboard charging systems.
10. Maintain and repair fuel systems.
11. Maintain and repair two-stroke cycle carburetors.
12. Maintain and repair inboard gas systems.
13. Maintain and repair cooling systems.
14. Maintain and repair lubrication systems.
15. Maintain and repair intermediate housings.
16. Maintain and repair stern drive upper gear case.
17. Perform upper to lower gear case maintenance.
18. Maintain and repair lower gear cases.
19. Maintain and repair transmissions.
20. Assemble and maintain outboard lower units and housing assemblies.
21. Use marine woods, metals and fiberglass.
22. Adjust and repair trailers.
23. Prepare and deliver sales merchandise.
24. Maintain and repair four-stroke cycle diesel engines (optional).
25. Maintain and repair inboard diesel systems.
26. Demonstrate appropriate communication skills.
27. Demonstrate appropriate math skills.
28. Demonstrate appropriate understanding of basic science.
29. Demonstrate employability skills.
30. Demonstrate and understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Marine Mechanics Technology POSTSECONDARY NUMBER: I490306

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations.
01.02 Use hand tools safely and properly.
01.03 Set up and use power tools safely and properly.
01.04 Set up and use precision measuring tools.
01.05 Drill and remove broken studs and install helicoils.
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.07 Identify and make gaskets and seals.
01.08 Read and use parts manuals.
01.09 Read, interpret and apply service manuals.
01.10 Locate and match electrical units by their symbols on a wiring diagram.

02.0 MAINTAIN AND REPAIR BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

02.01 Explain the basic principles of the operation of four-stroke cycle internal combustion engines.
02.02 Identify types of four-stroke cycle engines.
02.03 Locate engine serial and model numbers.
02.04 Identify engine assemblies and systems.
02.05 Diagnose valve and head problems by use of the visual inspection method.
02.06 Diagnose valve and head problems by use of the compression tester method.
02.07 Diagnose valve and head problems by use of the cylinder air pressure method.
02.08 Disassemble engines and inspect parts.
02.09 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
02.10 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin.
02.11 Grind valve seats and reface valves.
02.12 Check and inspect springs for free height, distortion and installed height.
02.13 Adjust valve lash.
02.14 Move and inspect camshafts and lifters.
02.15 Measure camshafts.
02.16 Clean and inspect lifters for wear.
02.17 Time valve drive assemblies.
02.18 Remove pistons from rod assemblies.
02.19 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer.
02.20 Check piston pins and bosses for wear.
02.21 Measure piston ring lands width, out-of-round and taper.
02.22 Measure the piston ring gap in cylinder bores.
02.23 Install and fit piston pins.
02.24 Check rod and piston assembly alignment.
02.25 Remove and replace rod bearings.
02.26 Hone and clean cylinders.
02.27 Install rings on pistons.
02.28 Measure and check crankshafts with a micrometer.
02.29 Check for end play.

02.30 Check bearing bores with a telescoping gauge.
02.31 Reassemble engines.
02.32 Install oil seals.
02.33 Diagnose valve and head problems by use of the stethoscope method.
02.34 Service camshaft bearings.

03.0 MAINTAIN AND REPAIR BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

03.01 Explain the basic principles of the operation of two-stroke cycle internal combustion engines.
03.02 Identify types of engines.
03.03 Locate engine serial and model numbers.
03.04 Identify engine assemblies and systems.
03.05 Disassemble engines.
03.06 Remove, clean and inspect heads for cracks, warpage and damaged spark plug threads.
03.07 Diagnose head problems by use of the visual inspection method.
03.08 Diagnose head problems by use of the compression tester method.
03.09 Diagnose head problems by use of the cylinder air pressure method.
03.10 Diagnose head problems by use of the stethoscope method.
03.11 Remove, clean and inspect piston rods and assemblies.
03.12 Measure out-of-round of pistons and cylinders.
03.13 Hone cylinders.
03.14 Check the total bearing surface of connecting rod bearings.
03.15 Measure piston skirts and ring grooves.
03.16 Measure the piston ring gap in cylinder bores.
03.17 Install piston pins according to manufacturer's specifications.
03.18 Check rod and piston assembly alignment.
03.19 Install rings on pistons.
03.20 Install piston rod assemblies.
03.21 Measure and check crankshafts with a micrometer.
03.22 Check needle bearings.
03.23 Inspect crankshafts and install seals.
03.24 Inspect, clean and/or replace reed valves.
03.25 Reassemble engines.

04.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

04.01 Set up and use voltmeters, ammeters and ohmmeters.
04.02 Locate and identify electrical circuit components.
04.03 Sketch a typical circuit using a single wire system.
04.04 Test storage batteries using a hydrometer.
04.05 Test storage batteries using a light and load test.
04.06 Charge storage batteries.
04.07 Remove and replace batteries and service battery boxes.
04.08 Repair damaged wire and electrical harnesses.
04.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop.
04.10 Sketch and label typical fuel gauge systems.
04.11 Remove and replace ammeters or indicating lights.
04.12 Remove and replace fuel gauges.
04.13 Remove and replace fuel sending units.
04.14 Diagnose gauges and accessory system troubles using test lights, voltmeters, ammeters or detached sending units.
04.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights.
04.16 Locate opens, shorts and grounds.

05.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:

05.01 Disassemble recoil starters.

05.02 Inspect components of recoil starters.
05.03 Reassemble recoil starters.
05.04 Identify components of electrical starting systems.
05.05 Disassemble different types of starting motors.
05.06 Bench test armatures.
05.07 Bench test field coils.
05.08 Bench test drive units.
05.09 Bench test switches.
05.10 Bench test minor parts of starting motor components.
05.11 Use armature lathes for turning commutators.
05.12 Install, reassemble and test new starter parts.
05.13 Troubleshoot starting systems using battery starter testers.
05.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop.
05.15 Recondition solenoids, drives and other components.
05.16 Set up and use battery starter (load) testers.
05.17 Locate opens, shorts and grounds.

06.0 MAINTAIN AND REPAIR MAGNETO IGNITION SYSTEMS--The student will be able to:

06.01 Sketch and label electrical symbols.
06.02 Set up and use ohmmeters.
06.03 Set up and use voltmeters.
06.04 Set up and use ignition testers.
06.05 Set up and use ignition analyzers.
06.06 Locate and identify parts of magneto ignitions.
06.07 Locate and match electrical units by their symbols on a wiring diagram.
06.08 Sketch and label complete magneto ignition systems.
06.09 Check coil resistance with an ohmmeter.
06.10 Check points for continuity and resistance.
06.11 Check condensers for capacity, leaks and shorts.
06.12 Clean and regap spark plugs.

07.0 MAINTAIN AND REPAIR BATTERY IGNITION SYSTEMS--The student will be able to:

07.01 Locate and identify parts of battery ignitions.
07.02 Locate and match electrical units by their symbols on a wiring diagram.
07.03 Sketch and label complete battery ignition systems.
07.04 Check coil resistance with an ohmmeter.
07.05 Check points for continuity and resistance.
07.06 Check condensers for capacity, leaks and shorts.
07.07 Set up and use test equipment.
07.08 Set timing using a timing light.

08.0 MAINTAIN AND REPAIR CAPACITOR DISCHARGE IGNITION SYSTEMS--The student will be able to:

08.01 Sketch and label electrical symbols.
08.02 Set up and use ohmmeters.
08.03 Set up and use a CD-77
08.04 Set up and use spark testers.
08.05 Set up and use neon test lights.
08.06 Set up and use low/high ammeters.
08.07 Set up and use voltmeters.
08.08 Locate and identify parts of capacitor discharge ignition systems.
08.09 Locate and match electrical units by their symbols on a wiring diagram.
08.10 Sketch and label complete C/D ignition systems.

08.11 Check coil resistance, shorts and grounds with an ohmmeter.
08.12 Check stator windings with an ohmmeter.
08.13 Check sensor coils, charge coils, ignition coils and shorts to ground with a CD-77.
08.14 Check power packs with an ohmmeter and a CD-77.

09.0 MAINTAIN AND REPAIR OUTBOARD CHARGING SYSTEMS--The student will be able to:

09.01 Sketch and label the units of complete charging circuits.
09.02 Disassemble charging systems and identify the components.
09.03 Perform stator and rectifier testing on charging systems.
09.04 Reassemble and test charging systems.
09.05 Set up and use ohmmeters.
09.06 Test regulators.
09.07 Reassemble and test complete units.

10.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

10.01 Identify and locate fuel system components (fuel tanks, lines, filters, etc.).
10.02 Sketch and label the parts of total fuel systems.
10.03 Service fuel lines.
10.04 Remove, clean and install fuel tanks.
10.05 Identify and locate fuel pump vacuums.
10.06 Remove, replace, service and check the pressure of fuel pumps.
10.07 Remove, clean and replace in-line filters.
10.08 Identify the major types of carburetors.
10.09 Check and adjust throttle and governor linkages.

11.0 MAINTAIN AND REPAIR TWO-STROKE CYCLE CARBURETORS--The student will be able to:

11.01 Sketch and label the parts of total fuel systems.
11.02 Service fuel lines and primer bulbs (vacuum test).
11.03 Remove, clean, inspect and install fuel tanks.
11.04 Identify basic carburetor circuits (chokes, floats, fuel inlets; idle, intermediate and high speeds; mains, etc.).
11.05 Identify and locate fuel pumps.
11.06 Remove, inspect and replace fuel pumps.
11.07 Remove, clean, overhaul, replace and make final adjustments to carburetors.
11.08 Remove, service and replace air cleaners.
11.09 Diagnose carburetor problems.
11.10 Remove, inspect and replace reed valves and gaskets.
11.11 Diagnose exhaust problems such as back pressure and scavenging.
11.12 Inspect and service oil metering systems.
11.13 Determine and make appropriate fuel-oil mixtures.

12.0 MAINTAIN AND REPAIR INBOARD GAS SYSTEMS--The student will be able to:

12.01 Remove, service and replace carburetor air cleaners/flame arrestors.
12.02 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages and intake manifolds).
12.03 Remove, clean, overhaul, replace and make final adjustments to carburetors.

13.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

13.01 Explain the principles of cooling systems, including fresh water cooling systems.

13.02 Trace water flow through cooling systems.
13.03 Disassemble and reassemble water pumps.
13.04 Remove, check and replace thermostats.
13.05 Use thermostat pressure relief systems.
13.06 Service manifolds, risers and thermostat housings.
13.07 Service water cooling systems for gas inboard, gas outboard and diesel engines.
13.08 Remove and replace gear cases.
13.09 Service sea strainers through hull fittings and valve oil coolers and heat exchangers.
13.10 Remove and replace circulator pumps.
13.11 Remove and rebuild fresh water pumps.
13.12 Remove and rebuild inboard sea pumps.
13.13 Remove and rebuild inboard/outboard sea pumps.

14.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

14.01 Identify the types and functions of lubrication systems.
14.02 Explain the principles of lubrication systems.
14.03 Identify and locate components of lubrication systems.
14.04 Check engines for oil leaks.
14.05 Change engine oil and filters.
14.06 Check engine oil pressure and level.
14.07 Recognize and use only recommended oil.

15.0 MAINTAIN AND REPAIR INTERMEDIATE HOUSINGS--The student will be able to:

15.01 Disassemble main drive shafts.
15.02 Shim drive shafts to intermediate housings.
15.03 Remove and replace clutch assemblies.
15.04 Check electrical components with proper test equipment.
15.05 Remove and replace "U" joints.
15.06 Disassemble outer transom plates.
15.07 Adjust trim and limit switches.
15.08 Disassemble cylinder rams.

16.0 MAINTAIN AND REPAIR STERN DRIVE UPPER GEAR CASE--The student will be able to:

16.01 Determine the differences between mechanical, electrical and hydraulic shifting units.
16.02 Disassemble and reassemble each type of shifting unit.
16.03 Reshim units to manufacturer's specifications.
16.04 Use the proper oil to refill upper and lower gear cases.

17.0 PERFORM UPPER TO LOWER GEAR CASE MAINTENANCE--The student will be able to:

17.01 Disassemble exhaust housings.
17.02 Inspect seals, "O" rings, shafts and bearings.
17.03 Reassemble exhaust housings.

18.0 MAINTAIN AND REPAIR LOWER GEAR CASES--The student will be able to:

18.01 Determine the differences between mechanical, electrical and hydraulic shifting.
18.02 Remove and replace lower gear cases.
18.03 Reshim lower gear cases.
18.04 Refill lower gear cases with specified oil.
18.05 Determine propeller pitch, diameter and hub type.

19.0 MAINTAIN AND REPAIR TRANSMISSIONS--The student will be able to:

19.01 Inspect planetary clutch plate air coupling assemblies.
19.02 Remove transmissions.
19.03 Use proper service tools in shimming, reassembly and testing.
19.04 Drain transmissions.
19.05 Determine capacity using the transmission service manuals.
19.06 Refill transmissions according to manufacturers' specifications.

20.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES--The student will be able to:

20.01 Disassemble and reassemble steering handle groups.
20.02 Disassemble and assemble exhaust housings and water tube assemblies.
20.03 Replace motor mounts and shock absorbers.
20.04 Lubricate all fittings.
20.05 Pressure and vacuum test gear cases.
20.06 Remove and test cylinders and rams.
20.07 Adjust reverse locks.
20.08 Adjust the rim and tilt.
20.09 Determine the differences between mechanical, electrical and hydraulic shifting units.
20.10 Explain the shifting theory of the lower unit.
20.11 Disassemble and reassemble mechanical shifting units.
20.12 Disassemble and reassemble electrical shifting units.
20.13 Disassemble and reassemble hydraulic shifting units.
20.14 Inspect all parts for wear.

21.0 USE MARINE WOODS, METALS, AND FIBERGLASS--The student will be able to:

21.01 Explain the hazards of a marine environment to woods, metals and fiberglass.
21.02 Explain an galvanic series.
21.03 Explain the theory for using given materials in boat repair activities.

22.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

22.01 Make boat to trailer adjustments.
22.02 Remove and replace lighting systems.
22.03 Remove and replace wheel bearings and springs.
22.04 Remove and replace brakes.
22.05 Disassemble, diagnose and reassemble trim and tilt systems.
22.06 Remove and test cylinder rams.
22.07 Adjust reverse locks.
22.08 Adjust the trim and tilt.

23.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

23.01 Make center line measurements for outboard motor installation.
23.02 Center the plate height.
23.03 Locate manufacturers' I.D. plates.
23.04 Mount control boxes at the helm.
23.05 Place wiring and cables in a neat and orderly manner.
23.06 Adjust the control cables from the engine to the control box.
23.07 Center the steering cable to the engine.
23.08 Find suitable locations for accessories and mount them to the boat.
23.09 Lubricate shafts, install propellers and fasten both securely.
23.10 Check for proper levels.
23.11 Check manufacturers' specifications.

23.12 Test-run boats.
23.13 Recheck work completed.
23.14 Check manufacturers' installation procedures for stern drive units.
23.15 Lubricate shafts and install propellers securely.
23.16 Obtain maximum oil level capacity.
23.17 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc..
23.18 Find a suitable mount location and mount the engine securely in the boat.
23.19 Set engines to manufacturers' specifications.
23.20 Set, adjust and test engines to manufacturers' specifications.
23.21 Remove and replace running lights.
23.22 Troubleshoot lighting systems and accessories.
23.23 Check and adjust throttles, cables, horns, lights and tachometers.

24.0 MAINTAIN AND REPAIR FOUR-STROKE CYCLE DIESEL ENGINES (OPTIONAL)--The student will be able to:

24.01 Explain the basic principles of the operation of four-stroke cycle diesel engines.
24.02 Identify types of four-stroke cycle engines.
24.03 Locate engine serial and model numbers.
24.04 Identify engine assemblies and systems.
24.05 Diagnose valve and head problems by use of the visual inspection method.
24.06 Diagnose valve and head problems by use of the compression tester method.
24.07 Diagnose valve and head problems by use of the cylinder air pressure method.
24.08 Diagnose valve and head problems by use of the stethoscope method.
24.09 Disassemble engines.
24.10 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
24.11 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin.
24.12 Grind valve seats and reface valves.
24.13 Check and inspect springs for free height, distortion and installed height.
24.14 Adjust valve lash.
24.15 Remove and inspect camshafts and lifters.
24.16 Measure camshafts.
24.17 Service camshaft bearings.
24.18 Clean and inspect lifters for wear.
24.19 Time valve drive assemblies.
24.20 Remove pistons from rod assemblies.
24.21 Measure out-of-round and cylinder taper with dial bore gauge or micrometer.
24.22 Check piston pins and bosses for wear.
24.23 Measure piston ring lands width, out-of-round and taper.
24.24 Measure the piston ring gap in cylinder bores.
24.25 Install and fit piston pins.
24.26 Check rod and piston assembly alignment.
24.27 Remove and replace rod bearings.
24.28 Hone and clean cylinders.
24.29 Install rings on pistons.
24.30 Measure and check crankshafts with a micrometer.
24.31 Check for end play.
24.32 Check bearing bores with a telescoping gauge.
24.33 Reassemble engines.
24.34 Install oil seals.

25.0 MAINTAIN AND REPAIR INBOARD/DIESEL SYSTEMS--The student will be able to:

25.01 Inspect, remove and replace alternator belts.
25.02 Check the output of charging systems.
25.03 Analyze malfunctions.
25.04 Test and overhaul alternators.
25.05 Remove and replace regulators.
25.06 Identify and locate fuel system components (fuel tanks, fuel lines, fuel pumps, air filters, governors and linkages and fuel injectors.)
25.07 Check fuel systems for leaks.
25.08 Bleed systems for starting.
25.09 Adjust nozzle pressure to manufacturer's specifications.
25.10 Set the injection pump angle (timing).
25.11 Check and adjust the throttle and governor linkage.
25.12 Check or replace glow plugs.
25.13 Check stop solenoids.

26.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

26.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
26.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
26.03 Read and follow written and oral instructions.
26.04 Answer and ask questions coherently and concisely.
26.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
26.06 Demonstrate appropriate telephone/communication skills.

27.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

27.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
27.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
27.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
27.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
27.05 Demonstrate an understanding of federal, state and local taxes and their computation.

28.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

28.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
28.02 Draw conclusions or make inferences from data.
28.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
28.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

29.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will able to :

29.01 Conduct a job search.
29.02 Secure information about a job.

29.03 Identify documents that may be required when applying for a job.
29.04 Complete a job application form correctly.
29.05 Demonstrate competence in job interview techniques.
29.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
29.07 Identify acceptable work habits.
29.08 Demonstrate knowledge of how to make appropriate job changes.
29.09 Demonstrate acceptable employee health habits.
29.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

30.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

30.01 Define entrepreneurship.
30.02 Describe the importance of entrepreneurship to the American economy.
30.03 List the advantages and disadvantages of business ownership.
30.04 Identify the risks involved in ownership of a business.
30.05 Identify the necessary personal characteristics of a successful entrepreneur.
30.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Marine Propulsion Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.080400

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinery mechanics; marine engines (85116617), or marine mechanics/deck engineers (623.281-010). This program also provides supplemental training persons previously or currently employed in this occupation.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: installation and operation of diesel and gasoline engines; troubleshooting for diesel and gasoline engines; engine maintenance; propeller selection; corrosion control; and fiberglass hull repair.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student will receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic shop practices.
02. Describe operational theory of (2) two and (4) four cycle engines - Diesel and Gasoline.
03. Use service manuals and parts references.
04. Perform basic welding skills.
05. Remove and install engines.
06. Recondition and service engines.
07. Perform diagnosis service and repairs to all types of marine ignition systems.
08. Develop skills in electrical-electronic theory of operation and application.
09. Troubleshoot and repair fuel systems.
10. Service cooling systems.
11. Service exhaust systems.
12. Demonstrate shop management functions.
13. Identify special marine principles.
14. Repair inboard drive systems.
15. Rig boats.
16. Repair lower units.
17. Perform corrosion experiments and understand corrosion control.
18. Apply fiberglass construction and maintenance procedures.
19. Demonstrate appropriate communication skills.
20. Demonstrate appropriate math skills.
21. Demonstrate appropriate understanding of basic science.
22. Demonstrate and practice employability skills.
23. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Marine Propulsion Technology POSTSECONDARY NUMBER:

01.0 PERFORM BASIC SHOP PRACTICES--The student will be able to:

01.01 Perform calculations using decimals and fractions to include subtraction, multiplication and division.
01.02 Change fractions to decimals and decimals to fractions.
01.03 Determine metric system measurements.
01.04 Comply with safety rules and regulations.
01.05 Operate hand tools safely and properly.
01.06 Set up and use power tools safely and properly.
01.07 Set up and use precision measuring tools.
01.08 Drill and remove broken studs and install helicoils.
01.09 Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.10 Install fasteners such as screws, bolts and keys; and utilize screw extractor, thread cutting tape and dies.
01.11 Locate and match electrical units by their symbols on a wiring diagram.
01.12 Draw performance charts and graphs on propeller selection and engine specifications.

02.0 DESCRIBE OPERATIONAL THEORY OF (2) TWO AND (4) FOUR CYCLE ENGINES - DIESEL AND GASOLINE--The student will be able to:

02.01 Distinguish between the characteristics of four-stroke cycle engine including diesel engines.
02.02 Identify basic engine parts.
02.03 Describe the functions of the crankshaft.
02.04 List the information which may be found on the engine nameplate.
02.05 Describe types of motion and simple machines and characteristics of energy.
02.06 Calculate problems using the formula for work, horsepower and torque.
02.07 Describe the main theoretical concept of heat engines.
02.08 Describe the process by which an internal combustion engine converts chemical energy into rotary motion.
02.09 Calculate problems using the formulas for engine cubic displacement and compression ratio.
02.10 Describe the principles of operation of four-and two-stroke cycle engines.
02.11 Identify the parts of a camshaft lobe-crankshaft lobe.
02.12 Describe valve timing and overlap procedures.
02.13 Identify types of valve arrangements.
02.14 Identify types of engine construction.
02.15 Describe piston engine operation, design loop charged.
02.16 Describe the operation of two- and four-stroke cycle engines to include diesel engines.
02.17 Distinguish different engine design by manufacturers.
02.18 Identify marine engine makeup and conversion from auto engines.

03.0 USE SERVICE MANUALS AND PARTS REFERENCES--The student will be able to:

03.01 Demonstrate use of multiple and single type shop service manual.
03.02 Demonstrate use of specification handbooks and tune up charts.
03.03 Demonstrate use of manufacturer parts catalogs.
03.04 Demonstrate use of microfiche.
03.05 Demonstrate use of marine engine installation manuals.

03.06 Demonstrate use of flat rate and service bulletins.

04.0 PERFORM BASIC WELDING SKILLS--The student will be able to:

04.01 Set up and operate gas and electric various welding equipment.
04.02 Burn (cut) material using mechanized or hand-held gas torch equipment.
04.03 Prepare metal surfaces for welding.
04.04 Identify type of metal to be welded.
04.05 Braze metal frames and structures.
04.06 Fabricate metal frames and structures.
04.07 Pressure test weldment.
04.08 Perform plug weld technique.
04.09 Gas weld ferrous metals in all positions with or without filler rod.
04.10 Perform TIG welding in aluminum and stainless steel.
04.11 Use and maintain TIG welding equipment.
04.12 Perform MIG type welding on various metals.
04.13 Use welding principles to heat and remove broken screws and bolts.

05.0 REMOVE AND INSTALL ENGINES--The student will be able to:

05.01 Disconnect engine, mounts, wiring and lines.
05.02 Operate hydraulic engine hoist.
05.03 Mount engine mounts, wiring and lines.
05.04 Reconnect engine mounts, wiring and lines.
05.05 Cut openings for different engine installations.
05.06 Mount jet drive type of engine.
05.07 Align inboard (gas and diesel) engines to manufacturers' specifications.
05.08 Mount and align stern drive to housing using manufacturers' special tools and manuals.

06.0 RECONDITION AND SERVICE ENGINES--The student will be able to:

06.01 Remove and replace power head.
06.02 Disassemble engine.
06.03 Clean engine parts for inspection.
06.04 Inspect and check for proper condition.
06.05 Remove and replace oil pump.
06.06 Remove and replace fuel pump.
06.07 Service a multi-piece crankshaft.
06.08 Replace connecting rods and bearings.
06.09 Grind valves and time valves.
06.10 Inspect and grind power head.
06.11 Remove and replace flywheel.
06.12 Remove and replace exhaust manifolds.
06.13 Perform cylinder compression test.
06.14 Perform engine tune up.
06.15 Perform operational inspection of engine lubrication system.
06.16 Remove and service piston ring and pistons.
06.17 Fit piston pins.
06.18 Inspect crankshaft, camshaft, connecting rods and piston assembly.
06.19 Torque power head and lower unit to specifications.
06.20 Hone cylinders to manufacturers' specifications.

07.0 PERFORM DIAGNOSIS SERVICE AND REPAIRS FOR ALL TYPES OF MARINE IGNITION SYSTEMS--The student will be able to:

07.01 Diagnose, repair and replace malfunctions of ignition system components.
07.02 Set ignition timing.

07.03 Inspect secondary circuit lead wires, distributor and rotor measure resistance in secondary wires.
07.04 Inspect points and condensers of the primary circuit.
07.05 Overhaul distributors.
07.06 Analyze or adjust engine performance using engine analyzer devices.
07.07 Remove and replace spark plugs.
07.08 Adjust armature air gap.
07.09 Time the ignition system for O/B engines.
07.10 Use specialized test equipment.
07.11 Test CD type ignition systems.
07.12 Describe differences between marine and automotive type ignition components.
07.13 Observe safety practices in marine applications.
07.14 Read and interpret manufacturers wire diagrams.
07.15 Operate an engine dynamometer.

08.0 DEVELOP SKILLS IN ELECTRICAL-ELECTRONIC THEORY OF OPERATION AND APPLICATION--The student will be able to:

08.01 Apply Ohm's Law to series circuit.
08.02 Apply Ohm's Law to parallel circuits.
08.03 Apply Ohm's Law to series-parallel circuits.
08.04 Perform continuity test.
08.05 Diagnose and repair alternator.
08.06 Diagnose and repair or replace charging system regulator.
08.07 Service or replace battery cables and battery box.
08.08 Diagnose, repair or replace starter.
08.09 Diagnose and repair malfunctions in the cranking system.
08.10 Perform operational inspection of lighting system.
08.11 Measure voltage drops, current flow, resistance in a circuit or component with a multimeter.
08.12 Repair or replace switches to include ignition switches.
08.13 Repair or replace fuse block assembly.
08.14 Locate and repair shorts and open circuits in wiring.
08.15 Inspect and test windshield wiper motor, blades and arms.
08.16 Inspect or replace rectifier.
08.17 Replace diode assembly.
08.18 Remove, replace and repair electrical remote control assembly.
08.19 Service and install diesel and gasoline marine alarm systems.

09.0 TROUBLESHOOT AND REPAIR FUEL SYSTEMS--The student will be able to:

09.01 Identify fuel system components.
09.02 Explain operation of fuel system and components.
09.03 Repair carburetion.
09.04 Repair gasoline injection systems.
09.05 Replace fuel system components.
09.06 Identify fuel systems malfunction.
09.07 Replace fuel filter.
09.08 Repair fuel lines.
09.09 Adjust carburetor.
09.10 Service automatic or manual choke.
09.11 Service fuel pump.
09.12 Analyze for foreign particles in fuel system.
09.13 Correct fuel tank installation.
09.14 Test engines fuel flow using manufacturers' procedures and test equipment.
09.15 Identify fuel and oil specification for outboard motors, four-cycle engines and diesel applications.
09.16 Repair and test diesel fuel injector nozzles.
09.17 Repair and test diesel fuel pumps.

09.18 Replace and adjust unit type injector or marine diesel engines.
09.19 Correct procedure and timing of fuel injector pumps.
09.20 Conduct diesel fuel pressure test.
09.21 Correct rack adjustment on diesel engines.

10.0 SERVICE COOLING SYSTEMS--The student will be able to:

10.01 Check engine temperature.
10.02 Test thermostat.
10.03 Inspect and/or replace water pump.
10.04 Inspect and/or replace circulating water pump.
10.05 Pressure test cooling system.
10.06 Remove, clean and replace water cooling parts.
10.07 Inspect and repair heat exchanges on gasoline and marine diesel engine.
10.08 Inspect and repair marine keel coolers.
10.09 Identify different types of approved coolant used in marine closed cooling systems.
10.10 Check engine block cooling passages for corrosion and build-up.

11.0 SERVICE EXHAUST SYSTEMS--The student will be able to:

11.01 Remove, inspect and replace an exhaust housing.
11.02 Remove, inspect and replace inner exhaust housing.
11.03 Remove, inspect and replace seal.
11.04 Remove, inspect and replace aft exhaust cover.
11.05 Remove, inspect and replace rubber mount.
11.06 Remove, inspect and replace clamp.
11.07 Remove, inspect and replace mount cover.
11.08 Remove, inspect and replace water tube.
11.09 Inspect service turbo charger.
11.10 Recommend correct exhaust tubing for different marine applications.
11.11 Service marine water cooled exhaust systems.
11.12 Determine back pressure by under stator exhaust applications.

12.0 DEMONSTRATE SHOP MANAGEMENT FUNCTIONS--The student will be able to:

12.01 Process work orders.
12.02 Process merchandise return.
12.03 Select shop equipment and materials.
12.04 Supervise employees.
12.05 Develop work schedules.
12.06 Process warranty claims.
12.07 Perform business and computation skills.
12.08 Use inventory card files and select parts from stock.
12.09 Sell marine merchandise.
12.10 Process sales and service receipts.
12.11 Operate computer for inventory control.
12.12 Operate computer for service orders.
12.13 Program computers for new marine parts/merchandise received.
12.14 Place marine merchandise into correct/orderly inventory.
12.15 Complete correct order forms and perform both by computer program and written process.

13.0 IDENTIFY SPECIAL MARINE PRINCIPLES--The student will be able to:

13.01 Explain basic principles of thrust in marine applications.
13.02 Explain basic principles of propulsion in marine applications.
13.03 Explain correct propeller selection and performance.
13.04 Identify types of hulls used in marine applications.
13.05 Explain speed-length ratio and calculate hull speed and engine

selection.
13.06 Identify bow angle and its effect on performance.
13.07 Perform dynamometer test on different engine horsepowers.
13.08 Perform test tank operations using manufacturer's test wheels.
13.09 Perform sea trials.
13.10 Identify transom heights and explain the effects on engine performance/speed/horsepower.

14.0 REPAIR INBOARD DRIVE SYSTEMS--The student will be able to:

14.01 Inspect gear housing assembly.
14.02 Determine fluid levels.
14.03 Adjust gear linkages.
14.04 Torque mounting bolts.
14.05 Inspect vacuum shift controls.
14.06 Inspect drive shaft.
14.07 Lubricate universal joint.
14.08 Inspect gimbal bearing.
14.09 Inspect constant velocity joint.
14.10 Measure drive shaft angle and runout.
14.11 Replace power transmission system.
14.12 Rebuild power transmission.
14.13 Correctly apply manufacturers' procedures in shimming and adjusting operations.

15.0 RIG BOATS--The student will be able to:

15.01 Install engine steering components.
15.02 Install and service electrical wiring harness.
15.03 Install and adjust trim tabs on outboard and stern drivers, both mechanical and hydraulic type.
15.04 Identify sea drive installation.
15.05 List methods of outboard motor transom bracket installation.
15.06 Describe and illustrate correct lighting/wiring procedures.
15.07 Install engine remote control by manufacturers specifications.

16.0 REPAIR LOWER UNITS--The student will be able to:

16.01 Lubricate lower unit.
16.02 Pressure and vacuum test lower unit.
16.03 Lubricate transom steering busing, cables, etc.
16.04 Inspect, clean and lubricate propeller shaft.
16.05 Inspect and install propeller.
16.06 Remove and replace magnets in lower unit.
16.07 Inspect, remove and replace vertical drive gear.
16.08 Remove, inspect and replace clutch dog.
16.09 Remove, inspect and replace clutch coils.
16.10 Remove, inspect and replace drive shaft pinion.
16.11 Remove, inspect and replace drive components.
16.12 Remove, inspect and replace lower unit seals.
16.13 Remove and replace swivel bracket.
16.14 Remove, inspect and replace forward and reverse driving gears.
16.15 Remove, inspect and replace drive shaft and components.
16.16 Remove, inspect and replace hydraulic pump, shaft rod end plunger.
16.17 Adjust trim tab.
16.18 Inspect and replace U-joints.
16.19 Inspect and repair or replace lower unit lock.
16.20 Remove, replace and repair tilt assemblies to include hydraulic tilt.
16.21 Correctly shim lower units to engine manufacturer's specifications.
16.22 Disassemble/reassemble stern drive gear cases.

16.23 Disassemble/inspect/service/reassemble inboard marine transmissions both gasoline and diesel.
16.24 Demonstrate the ability to analyze and solve problems, to do necessary research and to report the results in good form.
16.25 Develop individual responsibility for work done in the lab.
16.26 Develop an understanding and skill in testing and diagnosing marine engine service problems and to develop appreciation of the true value of testing equipment.
16.27 Calculate torque and gear ratio.
16.28 Compare and identify all types of gear arrangements.
16.29 Explain operation theory of mechanical shifting, electric shifting, and hydroelectric shifting.
16.30 Identify the major parts of these shifting mechanisms.
16.31 Understand by examination the principles of marine propulsion propeller theory.
16.32 Demonstrate an understanding of engine installation.
16.33 Apply knowledge to disassemble and assembly of all marine transmissions.
16.34 Handle lifting devices properly.
16.35 Diagnose planetary gear principle of operation and theory.

17.0 PERFORM CORROSION EXPERIMENTS AND UNDERSTAND CORROSION CONTROL--The student will be able to:

17.01 Identify galvanic corrosion.
17.02 Explain the use and function of the galvanic series.
17.03 Understand corrosion and its prevention.
17.04 List chemical equation and symbols.
17.05 Demonstrate a basic knowledge of electricity.
17.06 Identify maintenance of boat hulls and when to determine its time.
17.07 Identify difference in corrosion and cavitation.
17.08 Demonstrate by lab experiments cause of corrosion.
17.09 List in test form, actual lab reports in the field.
17.10 Distinguish fatigue corrosion.
17.11 Understand electrolysis and its causes of corrosions.
17.12 Correctly prepare metals for protective coatings.
17.13 Identify protective coatings.
17.14 Practice safe lab experiences with dangerous chemicals.
17.15 Demonstrate theory of operation of impress currents.
17.16 Show proper installation procedure of impress current unit onboard ship.
17.17 Maintain records and diagnose impress current failure.
17.18 Write report analysis on corrosion in our environment.
17.19 Identify non-metallic corrosion.
17.20 Define special tools used in the maintenance and testing of sacrificial anodes.
17.21 Understand acrylic and styrene copolymer coating.
17.22 List causes of stray current corrosion.

18.0 APPLY FIBERGLASS CONSTRUCTION AND MAINTENANCE PROCEDURES--The student will be able to:

18.01 Describe safe handling procedures and care of fiberglass resins and materials.
18.02 Apply mixture methods of resins, coal tars, gel coat and paints.
18.03 Describe fiberglass boat manufacturing concept.s
18.04 Prepare a mold for casting a fiberglass hull.
18.05 Describe installation procedures of decks and gunwale.
18.06 Repair damaged fiberglass hulls.
18.07 Apply modern methods of maintaining new and old fiberglass hulls.
18.08 Demonstrate advance methods of boat building and the manufacturing of fiberglass accessories.

19.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

19.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
19.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
19.03 Read and follow written and oral instructions.
19.04 Answer and ask questions coherently and concisely.
19.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
19.06 Demonstrate appropriate telephone/communication skills.

20.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

20.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
20.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
20.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
20.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
20.05 Demonstrate an understanding of federal, state and local taxes and their computation.

21.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

21.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
21.02 Draw conclusions or make inferences from data.
21.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
21.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

22.0 DEMONSTRATE EMPLOYABILITY SKILLS--the student will be able to:

22.01 Conduct a job search.
22.02 Secure information about a job.
22.03 Identify documents which may be required when applying for a job interview.
22.04 Complete a job application form correctly.
22.05 Demonstrate competence in job interview techniques.
22.06 Identify and adopt acceptable work habits.
22.07 Identify and adopt acceptable work habits.
22.08 Demonstrate knowledge of how to make appropriate job changes.
22.09 Demonstrate acceptable employee health habits.
22.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

23.01 Define entrepreneurship.
23.02 Describe the importance of entrepreneurship to the American economy.
23.03 List the advantages and disadvantages of business ownership.

23.04 Identify the risks involved in ownership of a business.
23.05 Identify the necessary personal characteristics of a successful entrepreneur.
23.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Masonry

CODE NUMBER: Secondary ______ Postsecondary I460102

Florida CIP 0646.010200

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G TROWEL TR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as brick masons (87302537), or bricklayers (861.381-018). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: blueprint reading and specifications; related mathematics; properties and characteristics of brick; trade terms; and construction of masonry buildings and building components.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: use and care of tools and bricklaying equipment; preparation of mortar; bonding methods; and laying brick and block to construct buildings and building components at a rate compatible with industry standards.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing basic masonry skills.
02. Demonstrate proficiency in using materials and mortar properly.
03. Lay out structures to industry standards.
04. Lay foundations to industry standards.
05. Mix and blend mortars and brick to industry standards.
06. Spread mortar and lay brick and block to industry standards.
07. Lay out the bond to industry standards.
08. Identify and install different types of flashing to industry standards.
09. Identify and install wall reinforcements and ties to industry standards.
10. Tool and point joints and walls to industry standards.
11. Demonstrate proficiency in constructing brick/masonry walls.
12. Demonstrate proficiency in performing construction details.
13. Demonstrate proficiency in performing cleaning operations.
14. Demonstrate productivity skills.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

SECONDARY NUMBER: ________

PROGRAM TITLE: Masonry

POSTSECONDARY NUMBER: I460102

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 Trace the history of the masonry industry.
01.02 Explain the importance of the construction industry to the local, state and national economy.
01.03 Identify available employment opportunities.
01.04 Explain three factors involved in good workmanship.
01.05 List personal safety rules.
01.06 List general job safety rules.
01.07 Demonstrate the correct way to lift heavy objects.
01.08 Explain the purpose of the Occupational Safety Health Administration (OSHA) act.
01.09 Qualify in applied basic first aid procedure.
01.10 Calculate area and volume problems.
01.11 Estimate materials needed for a specific job.
01.12 Solve estimating problems.
01.13 Solve basic ratio and proportion problems.
01.14 Identify hand tools.
01.15 Distinguish between modular rule and brick spacing rule.
01.16 List factors to consider when selecting a brick trowel.
01.17 List basic rules concerning care of hand tools.
01.18 List basic rules concerning safe use of hand tools.
01.19 Demonstrate the proper use of hand tools.
01.20 Identify power tools.
01.21 List Safety rules for operating a masonry saw.
01.22 Cut masonry units using a table saw with an abrasive blade.
01.23 Cut masonry units using a table saw with a diamond blade.
01.24 Setup and operate power tools safely.
01.25 Identify types of drawings.
01.26 Identify symbols on blueprints.
01.27 List items found in a set of masonry symbols.
01.28 List items on a detail drawing.
01.29 Demonstrate the ability to use an architect's scale by scaling a drawing.
01.30 Explain the difference between a plan view, an elevation and a section on blueprints.
01.31 Interpret a set of specifications.
01.32 Demonstrate the ability to read and interpret simple blueprints.
01.33 Interpret a finish schedule.
01.34 Read and interpret local building codes and national standards.
01.35 Identify the parts of an oxyacetylene cutting outfit.
01.36 Identify types of oxyacetylene cutting flames.
01.37 List reasons for poor cuts.
01.38 List reasons for backfires.
01.39 Arrange, in order, steps to follow in case of flash backs.
01.40 Set up equipment for oxyacetylene cutting.
01.41 Turn on, light, adjust to a neutral flame and turn off oxyacetylene cutting equipment.
01.42 Make a 90 degree cut in mild steel and restart a cut.
01.43 Cut round stock.
01.44 List types of arc welders.
01.45 List types of electrodes.
01.46 List sizes of electrodes.
01.47 List factors to consider when selecting electrodes.

01.48 Identify the steps of the welding process.
01.49 Identify the kinds of welds.
01.50 Identify the types of weld joints.
01.51 List safety precautions pertaining to welding.
01.52 Demonstrate the ability to use two methods to strike an arc.
01.53 Start, stop and restart a bead.
01.54 Construct a pad weld.
01.55 Construct a butt weld.

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY--The student will be able to:

02.01 Identify five types of clay/brick used in the local area.
02.02 Identify five types of concrete masonry units (CMU) used in the local area.
02.03 Identify five types of natural stone used in the local area.
02.04 Identify concrete precast units (i.e., sills and lintels).
02.05 Identify masonry accessories used in the local area (i.e., wall ties and wall reinforcement).
02.06 Label the parts of a brick.
02.07 Distinguish between modular and non-modular brick.
02.08 Identify brick positioning in a wall.
02.09 Identify shapes of concrete masonry units.
02.10 List kinds of sills and lintels.
02.11 List types of cut stone.
02.12 List principal uses of refractory brick.
02.13 Identify types of kilns used in brick manufacturing.
02.14 Identify steps used in brick manufacturing.
02.15 Describe procedures used to manufacture concrete block.
02.16 Identify mortar by components (aggregate, cementitious materials, and additives).
02.17 Identify types of mortar (M, N, S and O) and proportioning.
02.18 Identify colored mortars (admix and factory blended).
02.19 Identify types and purposes of grouts for reinforced to non-reinforced masonry.

03.0 LAY OUT STRUCTURES TO INDUSTRY STANDARDS--The student will be able to:

03.01 Identify methods of layout.
03.02 Identify types of bonds.
03.03 Identify load-bearing and non-load-bearing walls.
03.04 List types of reinforced masonry.
03.05 Identify types of through wall bonding.
03.06 Identify types of flashing.
03.07 Identify types of leads.
03.08 Identify types of tooling.
03.09 Establish building layouts.
03.10 Use a transit to establish level.
03.11 Erect batter boards and locate building lines.
03.12 Square boarding using the six-eight-ten rule.
03.13 Make a story pole.
03.14 Identify measuring tools.
03.15 List uses of modular and spacing rules.
03.16 Identify symbols and abbreviations.
03.17 List items found in a set of a masonry symbols.
03.18 List items on a detail drawing.
03.19 Scale a drawing using an architect's scale.
03.20 Read and interpret a simple blueprint.
03.21 Interpret a finish schedule.
03.22 Identify types of levels.
03.23 Identify types of self reading rods.
03.24 List common errors contributing to incorrect measurements.

03.25 Identify hand motions used by an instrument person.
03.26 Read a self reading rod.
03.27 Set up and adjust a builder's level.
03.28 Erect and inspect scaffolding in accordance with Occupational Safety Health Administration (OSHA) standards.

04.0 LAY FOUNDATIONS TO INDUSTRY STANDARDS--The student will be able to:

04.01 Lay out footings.
04.02 Place rebar.
04.03 Place and rough finish concrete.
04.04 Lay out and establish grades for foundations.
04.05 Establish corners and lay out concrete block according to a specific bonding plan.
04.06 Lay foundation walls to joist and brick shelf height.
04.07 Waterproof foundation walls.
04.08 Install flashing, anchor bolts, termite shields and weep holes.

05.0 MIX AND BLEND MORTARS AND BRICK TO INDUSTRY STANDARDS--The student will be able to:

05.01 Identify tools and equipment used for mixing mortar.
05.02 List factors affecting the consistency of mortar.
05.03 List common ratios of mortar mixtures.
05.04 Mix types of mortar (M, N, S and O) mechanically and by hand.
05.05 Retemper mortar.
05.06 Mix tuck pointing mortar.
05.07 Blend brick according to the color range.

06.0 SPREAD MORTAR AND LAY BRICK AND BLOCK TO INDUSTRY STANDARDS--The student will be able to:

06.01 Demonstrate the correct way to hold a trowel.
06.02 Demonstrate the ability to manipulate a trowel.
06.03 Select the proper trowel for laying brick.
06.04 Demonstrate the cupping method of picking up mortar for brick.
06.05 Identify methods of picking up mortar from the mortar board.
06.06 Identify the direction of travel when placing mortar while laying brick.
06.07 Identify types of bedding.
06.08 Demonstrate the pick and dip method for laying brick.
06.09 Demonstrate the method for spreading mortar for brick.
06.10 Demonstrate different styles of crosshead joints.
06.11 Spread mortar on a 2 X 2 for brick.
06.12 Identify methods of putting up the line.
06.13 Lay brick to the line with established leads.
06.14 Build a 90 degree brick lead.
06.15 Select the proper trowel for laying block.
06.16 Demonstrate the method for picking up mortar for block.
06.17 Demonstrate the method for faceshell spreading of mortar for block.
06.18 Spread mortar on a 2 x 4 for block.
06.19 Lay block to the line with established leads.
06.20 Build a 90 degree block lead.

07.0 LAY OUT THE BOND TO INDUSTRY STANDARDS--The student will be able to:

07.01 Lay out the first two courses for bonding.
07.02 Lay out using English cross bond.
07.03 Lay out using Flemish cross bond.
07.04 Lay out using Dutch cross bond.
07.05 Lay out using 1/3 bond.

07.06 Lay out using stack bond.
07.07 Lay out using running bond.
07.08 Lay out using common bond.
07.09 Demonstrate the ability to lay brick in soldier position.
07.10 Demonstrate the ability to lay brick in header position.
07.11 Demonstrate the ability to lay brick in rowlock position.
07.12 Demonstrate the ability to lay brick in sailor position.

08.0 IDENTIFY AND INSTALL DIFFERENT TYPES OF FLASHING TO INDUSTRY STANDARDS--The student will be able to:

08.01 Identify types of flashing.
08.02 Install a base through wall cavity wall flashing.
08.03 Install brick veneer base flashing.
08.04 Install flashing in reglet.
08.05 Install flashing for sills and heads of openings.

09.0 IDENTIFY AND INSTALL WALL REINFORCEMENTS AND TIES TO INDUSTRY STANDARDS--The student will be able to:

09.01 Identify four types of joint reinforcement used locally.
09.02 Install truss or ladder wall reinforcing.
09.03 Install dovetail anchors, adjustable wall ties and corrugated veneer ties.
09.04 Identify methods of layout.
09.05 Identify types of bonds.
09.06 Identify load-bearing and non-load-bearing walls.
09.07 List types of reinforced masonry.
09.08 List factors to consider when building a cavity wall.
09.09 Identify types of through wall bonding.
09.10 List types of reinforcement.

10.0 TOOL AND POINT JOINTS AND WALLS TO INDUSTRY STANDARDS--The student will be able to:

10.01 Tool concave joints.
10.02 Tool rake joints.
10.03 Tool weather joints.
10.04 Tool V-jointer joints.
10.05 Tool grapevine joints.
10.06 Tool stuck joints.
10.07 Cut/rough joints.
10.08 Tuck point a wall.
10.09 Brush and touch up a wall.

11.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

11.01 Set up the job.
11.02 Arrange masonry materials for efficient use.
11.03 Place mortar pans properly.
11.04 Temper or shake up mortar with the proper shovels.
11.05 Lay out the structure.
11.06 Lay out the bond.
11.07 Establish corners and leads.
11.08 Pull the line.
11.09 Lay the specified masonry materials to job plan.

12.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION DETAILS--The student will be able to:

12.01 Identify five types of arches (flat, jack, Gothic, semicircle, Corinthian).
12.02 List purposes of arches.
12.03 Identify types of paving.
12.04 Identify types of paving patterns.
12.05 List purposes of masonry paving.
12.06 Identify types of precast panels.
12.07 List purposes of grouting.
12.08 Construct paving using a given plan.
12.09 Construct a column using a given plan.
12.10 Construct a pier using a given plan.
12.11 Lay out and construct arches from given plans.
12.12 Identify types of fireplaces.
12.13 List factors to consider when constructing fireplaces and chimneys.
12.14 List characteristics of firebrick.
12.15 Distinguish between firebrick mortar and brick mortar.
12.16 Demonstrate the ability to butter firebrick.
12.17 Construct a firebox.
12.18 Construct a fireplace.
12.19 Identify components of fireplaces and chimneys.
12.20 Lay out and construct a fireplace and chimney to given plans.
12.21 Lay out a wall section using glass block or other new local materials.

13.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

13.01 List reasons for cleaning.
13.02 Identify cleaning equipment.
13.03 List types of cleaning material.
13.04 Identify pointing tools.
13.05 Point new work.
13.06 Point old work.
13.07 List reasons for caulking.
13.08 Match types of caulking to specific uses.
13.09 Identify caulking tools.
13.10 Caulk expansion joints.
13.11 List safety precautions to follow when cleaning.
13.12 Identify five methods of wall cleaning.
13.13 Prepare cleaning solutions.
13.14 Prepare the wall.
13.15 Wash the wall.

14.0 DEMONSTRATE PRODUCTIVITY SKILLS--The student will be able to:

14.01 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 100-200.
14.02 Lay standard 8" brick--jointed on one side--on straight brick veneer wall-with established leads--at an average daily rate of 200-300.
14.03 Lay standard 8" brick--jointed on one side--on straight brick veneer wall-with established leads--at an average daily rate of 300-400.
14.04 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 400-500.
14.05 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 500-600.
14.06 Lay standard 8" brick--jointed on one side--on straight brick

veneer wall-with established leads--at an average daily rate of 600-700.
14.07 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 700-800.
14.08 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of over 800.
14.09 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 50-100.
14.10 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 100-150.
14.11 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 150-200.
14.12 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 200-250.
14.13 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 250-300.
14.14 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 300-350.
14.15 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 350-400.
14.16 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of over 400.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Masonry Skills

CODE NUMBER: Secondary 8722700 Postsecondary ______

Florida CIP 0646.011201

SECONDARY SCHOOL CREDITS 4 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 x 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G TROWEL TR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as masonry and tile setters helpers (98311978), or bricklayers helpers. This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: orientation to the industry; blueprint reading and specifications; related mathematics; properties and characteristics of brick; and trade terms.

The course content should also include training in communication leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8722710	Masonry Skills 1
8722720	Masonry Skills 2
8722730	Masonry Skills 3
8722740	Masonry Skills 4

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped

student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing basic masonry skills.
02. Demonstrate proficiency in using materials and mortar properly.
03. Perform basic lay out to industry standards.
04. Mix and blend mortars and brick to industry standards.
05. Spread mortar and lay brick and block to industry standards.
06. Demonstrate proficiency in constructing brick/masonry walls.
07. Lay out the bond to industry standards.
08. Tool and point joints and walls to industry standards.
09. Demonstrate proficiency in performing cleaning operations.
10. Identify and install different types of flashing to industry standards.
11. Identify and install wall reinforcements and ties to industry
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.
standards.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — SECONDARY NUMBER: 8722700

PROGRAM TITLE: Masonry Skills — POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 Trace the history of the masonry industry.
01.02 Explain the importance of the construction industry to the local, state and national economy.
01.03 Identify available employment opportunities.
01.04 Explain three factors involved in good workmanship.
01.05 List personal safety rules.
01.06 List general job safety rules.
01.07 Demonstrate the correct way to lift heavy objects.
01.08 Explain the purpose of the Occupational Safety Health Administration (OSHA) act.
01.09 Qualify in applied basic first aid procedure.
01.10 Identify hand tools.
01.11 Distinguish between modular rule and brick spacing rule.
01.12 List factors to consider when selecting a brick trowel.
01.13 List basic rules concerning care of hand tools.
01.14 List basic rules concerning safe use of hand tools.
01.15 Demonstrate the proper use of hand tools.
01.16 Identify power tools.
01.17 List safety rules for operating a masonry saw.
01.18 Cut masonry units using a table saw with an abrasive blade.
01.19 Cut masonry units using a table saw with an diamond blade.
01.20 Set up and operate power tools safely.

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY--The student will be able to:

02.01 Identify five types of clay/brick used in the local area.
02.02 Identify five types of concrete masonry units (CMU) used in the local area.
02.03 Identify concrete precast units (i.e., sills and lintels).
02.04 Identify masonry accessories used in the local area (i.e., wall ties and wall reinforcement.)
02.05 Label the parts of a brick.
02.06 Distinguish between modular and non-modular brick.
02.07 Identify brick position in a wall.
02.08 Identify shapes of concrete masonry units.
02.09 List kinds of sills and lintels.
02.10 List principal uses of refractory brick.
02.11 Identify types of kilns used in brick manufacturing.
02.12 Identify steps used in brick manufacturing.
02.13 Identify mortar by components (aggregate, cementitious materials, and additives).
02.14 Identify types of mortar (M,N,S and O) and proportioning.
02.15 Identify five types of natural stone used in the local area.
02.16 List types of cut stone.
02.17 Describe procedures used to manufacture concrete block.
02.18 Identify colored mortars (admix, factory blended).
02.19 Identify types and purposes of grants for reinforced to nonreinforced masonry.

03.0 PERFORM BASIC LAY OUT TO INDUSTRY STANDARDS--The student will be able to:

03.01 Identify methods of layout.
03.02 Identify types of bonds.
03.03 Identify load-bearing and non-load-bearing walls.
03.04 List types of reinforced masonry.
03.05 Identify types of through wall bonding.
03.06 Identify types of flashing.
03.07 Identify types of leads.
03.08 Identify types of tooling.
03.09 Identify measuring tools.
03.10 List uses of modular and spacing rules.

04.0 MIX AND BLEND MORTARS AND BRICK TO INDUSTRY STANDARDS--The student will be able to:

04.01 Identify tools and equipment used for mixing mortar.
04.02 List factors affecting the consistency of mortar.
04.03 List common ratios of mortar mixtures.
04.04 Retemper mortar.
04.05 Blend brick according to the color range.
04.06 Mix types of mortar (M,N,S,O) mechanically and by hand.
04.07 Mix tuck pointing mortar.

05.0 SPREAD MORTAR AND LAY BRICK AND BLOCK TO INDUSTRY STANDARDS--The student will be able to:

05.01 Demonstrate the correct way to hold a trowel.
05.02 Demonstrate the ability to manipulate a trowel.
05.03 Select the proper trowel for laying brick.
05.04 Demonstrate the cupping method of picking up mortar for brick.
05.05 Identify methods of picking up mortar from the mortar board.
05.06 Identify the direction of travel when placing mortar while laying brick.
05.07 Identify types of bedding.
05.08 Demonstrate the method for spreading mortar for brick.
05.09 Demonstrate different styles of crosshead joints.
05.10 Spread mortar on a 2x4 for brick.
05.11 Identify methods of putting up the line.
05.12 Lay brick to the line with established leads.
05.13 Build a 90 degree brick lead.
05.14 Select the proper trowel for laying block.
05.15 Demonstrate the method for picking up mortar for block.
05.16 Demonstrate the method for faceshell spreading of mortar for block.
05.17 Spread mortar on a 2x4 for block.
05.18 Lay block to the line with established leads.
05.19 Build a 90 degree block lead.
05.20 Lay brick in soldier position.
05.21 Lay brick in header position.
05.22 Lay brick in rowlock position.
05.23 Lay brick in sailor position.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

06.01 Set up the job.
06.02 Arrange masonry materials for efficient use.
06.03 Place mortar pans properly.
06.04 Temper or shake up mortar with the proper shovels.
06.05 Lay out the structure.
06.06 Lay out the bond.
06.07 Establish corners and leads.
06.08 Pull the line.

06.09 Lay the specified masonry materials to job plan.

07.0 LAY OUT THE BOND TO INDUSTRY STANDARDS--The student will be able to:

07.01 Lay out the first two courses for bonding.
07.02 Lay out using running bond.

08.0 TOOL AND POINT JOINTS AND WALLS TO INDUSTRY STANDARDS--The student will be able to:

08.01 Tool concave joints.
08.02 Tool rake joints.
08.03 Tool V-jointer joints.
08.04 Brush and touch up a wall.
08.05 List reasons for caulking.
08.06 Match types of caulking to specific uses.
08.07 Identify caulking tools.
08.08 Caulk expansion joints.
08.09 Tool stuck joints.
08.10 Cut/rough joints.
08.11 Tuck point a wall.

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

09.01 List reasons for cleaning.
09.02 Identify cleaning equipment.
09.03 List types of cleaning material.
09.04 Identify pointing tools.
09.05 Point new work.
09.06 Point old work.
09.07 List safety precautions to follow when cleaning.
09.08 Prepare cleaning solutions.
09.09 Prepare the wall.
09.10 Wash the wall.

10.0 IDENTIFY AND INSTALL DIFFERENT TYPES OF FLASHING TO INDUSTRY STANDARDS--The student will be able to:

10.01 Identify types of flashing.
10.02 Install a base through wall cavity wall flashing.
10.03 Install brick veneer base flashing.
10.04 Install flashing in reglet.
10.05 Install flashing for sills and heads of openings.

11.0 IDENTIFY AND INSTALL WALL REINFORCEMENTS AND TIES TO INDUSTRY STANDARDS--The student will be able to:

11.01 Identify four types of joint reinforcement used locally.
11.02 Install truss or ladder wall reinforcing.
11.03 Install dovetail anchors, adjustable wall ties and corrugated veneer ties.
11.04 Identify methods of layout.
11.05 Identify types of bonds.
11.06 Identify load-bearing and non-load-bearing walls.
11.07 List types of reinforced masonry.
11.08 List factors to consider when building a cavity wall.
11.09 Identify types of through wall bonding.
11.10 List types of reinforcement.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:
16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Masonry Skills PROGRAM NUMBER: 8722700

COURSE TITLE: Masonry Skills 1 COURSE NUMBER: 8722710

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 Trace the history of the masonry industry.
01.02 Explain the importance of the construction industry to the local, state and national economy.
01.03 Identify available employment opportunities.
01.04 Explain three factors involved in good workmanship.
01.05 List personal safety rules.
01.06 List general job safety rules.
01.07 Demonstrate the correct way to lift heavy objects.
01.08 Explain the purpose of the Occupational Safety Health Administration (OSHA) act.
01.09 Qualify in applied basic first aid procedure.
01.10 Identify hand tools.
01.11 Distinguish between modular rule and brick spacing rule.
01.12 List factors to consider when selecting a brick trowel.
01.13 List basic rules concerning care of hand tools.
01.14 List basic rules concerning safe use of hand tools.
01.15 Demonstrate the proper use of hand tools.
01.16 Identify power tools.
01.17 Apply safety rules for operating a masonry saw.

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY--The student will be able to:

02.01 Identify five types of clay/brick used in the local area.
02.02 Identify five types of concrete masonry units (CMU) used in the local area.
02.03 Identify concrete precast units (i.e., sills and lintels).
02.04 Identify masonry accessories used in the local area (i.e., wall ties and wall reinforcement.)
02.05 Label the parts of a brick.
02.06 Distinguish between modular and non-modular brick.
02.07 Identify brick position in a wall.
02.08 Identify shapes of concrete masonry units.
02.09 List kinds of sills and lintels.
02.10 List principal uses of refractory brick.
02.11 Identify types of kilns used in brick manufacturing.
02.12 Identify steps used in brick manufacturing.
02.13 Identify mortar by components (aggregate, cementitious materials, and additives).
02.14 Identify types of mortar (M,N,S and O) and proportioning.
02.15 Identify five types of natural stone used in the local area.
02.16 List types of cut stone.
02.17 Describe procedures used to manufacture concrete block.
02.18 Identify colored mortars (admix, factory blended).
02.19 Identify types and purposes of grants for reinforced to nonreinforced masonry.

03.0 PERFORM BASIC LAY OUT TO INDUSTRY STANDARDS--The student will be able to:

03.09 Identify measuring tools.
03.10 List uses of modular and spacing rules.

04.0 MIX AND BLEND MORTARS AND BRICK TO INDUSTRY STANDARDS--The student will be able to:

04.01 Identify tools and equipment used for mixing mortar.
04.02 List factors affecting the consistency of mortar.
04.03 List common ratios of mortar mixtures.

05.0 SPREAD MORTAR AND LAY BRICK AND BLOCK TO INDUSTRY STANDARDS--The student will be able to:

05.01 Hold a trowel correctly.
05.02 Manipulate a trowel skillfully.
05.03 Select the proper trowel for laying brick.
05.04 Pick up mortar for brick using the cupping method.
05.05 Identify methods of picking up mortar from the mortar board.
05.06 Identify the direction of travel when placing mortar while laying brick.
05.07 Identify types of bedding.
05.08 Spread mortar for brick properly.
05.09 Apply different styles of crosshead joints.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

06.01 Set up the job.
06.02 Arrange masonry materials for efficient use.
06.03 Place mortar pans properly.
06.04 Temper or shake up mortar with the proper shovels.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Masonry Skills
PROGRAM NUMBER: 8722700

COURSE TITLE: Masonry Skills 2
COURSE NUMBER: 8722720

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.18 Cut masonry units using a table saw with an abrasive blade.
01.19 Cut masonry units using a table saw with a diamond blade.

01.20 Set up and operate power tools safely.

04.0 MIX AND BLEND MORTARS AND BRICK TO INDUSTRY STANDARDS--The student will be able to:

04.04 Retemper mortar.
04.05 Blend brick according to the color range.
04.06 Mix types of mortar (M,N,S,O) mechanically and by hand.
04.07 Mix tuck pointing mortar.

05.0 SPREAD MORTAR AND LAY BRICK AND BLOCK TO INDUSTRY STANDARDS--The student will be able to:

05.10 Spread mortar on a 2x4 for brick.
05.11 Identify methods of putting up the line.
05.12 Lay brick to the line with established leads.
05.13 Build a 90 degree brick lead.
05.14 Select the proper trowel for laying block.
05.15 Demonstrate the method for picking up mortar for block.
05.16 Demonstrate the method for faceshell spreading of mortar for block.
05.17 Spread mortar on a 2x4 for block.
05.18 Lay block to the line with established leads.
05.19 Build a 90 degree block lead.

07.0 LAY OUT THE BOND TO INDUSTRY STANDARDS--The student will be able to:

07.01 Lay out the first two courses for bonding.
07.02 Lay out using running bond.

08.0 TOOL AND POINT JOINTS AND WALLS TO INDUSTRY STANDARDS--The student will be able to:

08.01 Tool concave joints.
08.02 Tool rake joints.
08.03 Tool V-jointer joints.
08.04 Brush and touch up a wall.
08.05 List reasons for caulking.
08.06 Match types of caulking to specific uses.
08.07 Identify caulking tools.
08.08 Caulk expansion joints.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.

15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Masonry Skills	PROGRAM NUMBER: 8722700
COURSE TITLE: Masonry Skills 3	COURSE NUMBER: 8722730

COURSE DESCRIPTION:

03.0 PERFORM BASIC LAY OUT TO INDUSTRY STANDARDS--The student will be able to:

03.01 Identify methods of layout.
03.02 Identify types of bonds.
03.03 Identify load-bearing and non-load-bearing walls.
03.04 List types of reinforced masonry.
03.05 Identify types of through wall bonding.
03.06 Identify types of flashing.
03.07 Identify types of leads.
03.08 Identify types of tooling.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

06.05 Lay out the structure.
06.06 Lay out the bond.
06.07 Establish corners and leads.
06.08 Pull the line.
06.09 Lay the specified masonry materials to job plan.

08.0 TOOL AND POINT JOINTS AND WALLS TO INDUSTRY STANDARDS--The student will be able to:

08.09 Tool stuck joints.
08.10 Cut/rough joints.
08.11 Tuck point a wall.

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

09.01 List reasons for cleaning.
09.02 Identify cleaning equipment.
09.03 List types of cleaning material.
09.04 Identify pointing tools.
09.05 Point new work.
09.06 Point old work.
09.07 List safety precautions to follow when cleaning.
09.08 Prepare cleaning solutions.
09.09 Prepare the wall.
09.10 Wash the wall.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Masonry Skills

PROGRAM NUMBER: 8722700

COURSE TITLE: Masonry Skills 4

COURSE NUMBER: 8722740

COURSE DESCRIPTION:

05.0 SPREAD MORTAR AND LAY BRICK AND BLOCK TO INDUSTRY STANDARDS--The student will be able to:

05.20 Lay brick in soldier position.
05.21 Lay brick in header position.
05.22 Lay brick in rowlock position.
05.23 Lay brick in sailor position.

10.0 IDENTIFY AND INSTALL DIFFERENT TYPES OF FLASHING TO INDUSTRY STANDARDS--The student will be able to:

10.01 Identify types of flashing.
10.02 Install a base through wall cavity wall flashing.
10.03 Install brick veneer base flashing.
10.04 Install flashing in reglet.
10.05 Install flashing for sills and heads of openings.

11.0 IDENTIFY AND INSTALL WALL REINFORCEMENTS AND TIES TO INDUSTRY STANDARDS--The student will be able to:

11.01 Identify four types of joint reinforcement used locally.
11.02 Install truss or ladder wall reinforcing.
11.03 Install dovetail anchors, adjustable wall ties and corrugated veneer ties.
11.04 Identify methods of layout.
11.05 Identify types of bonds.
11.06 Identify load-bearing and non-load-bearing walls.
11.07 List types of reinforced masonry.

11.08 List factors to consider when building a cavity wall.
11.09 Identify types of through wall bonding.
11.10 List types of reinforcement.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Meat Cutting

CODE NUMBER: Secondary 8763300 Postsecondary I480402

Florida CIP 0648.040200

SECONDARY SCHOOL CREDITS 6   COLLEGE CREDITS ___   POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 x 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: MEAT CUTTE @ 7 G   ¶QUAN FOOD @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as butchers and meatcutters (65023668), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and preparation of meats for food service establishments and the retail market.

Listed below are the courses that comprise this program when offered at the secondary level:

8763310	Meat Cutting 1
8763320	Meat Cutting 2
8763330	Meat Cutting 3
8763340	Meat Cutting 4
8763350	Meat Cutting 5
8763360	Meat Cutting 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in sanitation, use of tools and equipment, meat inspection and identification, and cutting, grinding, preservation, pricing, packaging, and weighing meat, poultry and seafood.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped

student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Operate power equipment, handtools, and sanitation procedures.
02. Prepare beef for retail display.
03. Prepare pork for retail display.
04. Prepare poultry for retail display.
05. Prepare variety meats (offals) for retail display.
06. Prepare custom cuts for special orders.
07. Demonstrate knowledge and skills of meat preservation, grinding, retail packaging and pricing.
08. Prepare veal and baby beef for retail display.
09. Prepare lamb for retail display.
10. Prepare fish and seafood for retail display.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8763300

PROGRAM TITLE: Meat Cutting POSTSECONDARY NUMBER: 1480402

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

01.01 Identify, use, clean, and maintain scales.
01.02 Identify, use, clean, and maintain slicing machine.
01.03 Identify, use, clean, and maintain meat tenderizers.
01.04 Identify, use, clean, and maintain meat grinders.
01.05 Identify, use, clean, and maintain meat saws.
01.06 Identify, use, clean, and maintain knives.
01.07 Identify, use, clean, and maintain oilstones.
01.08 Identify, use, clean, and maintain display cases.
01.09 Maintain clean work area.
01.10 Disconnect equipment from electrical source when performing maintenance and adjustments.
01.11 Use and maintain safety guards properly.
01.12 Use proper safety precautions when sharpening knives.
01.13 Clean and sanitize concrete surfaces.
01.14 Clean and sanitize glass surfaces.
01.15 Clean and sanitize metal surfaces.
01.16 Clean and sanitize porcelain surfaces.
01.17 Clean and sanitize tile surfaces.
01.18 Clean and sanitize wood surfaces.

02.0 PREPARE BEEF FOR RETAIL DISPLAY--The student will be able to:

02.01 Bone beef.
02.02 Break beef forequarter and hindquarter.
02.03 Cube beef by machine.
02.04 Cut and prepare beef brains.
02.05 Cut and prepare beef heart.
02.06 Cut and prepare beef liver.
02.07 Cut and prepare beef tongue.
02.08 Slice beef brisket.
02.09 Cut whole beef brisket, bone in.
02.10 Debone whole beef brisket.
02.11 Cut beef carcass into wholesale cuts.
02.12 Cut beef chuck.
02.13 Cut beef flank.
02.14 Cut beef foreshank.
02.15 Cut beef kidneys.
02.16 Cut standing rib roast.
02.17 Cut rib steaks.
02.18 Cut full beef round.
02.19 Cut beef round.
02.20 Cut heel of round.
02.21 Cut hind shank.
02.22 Cut porterhouse steak.
02.23 Cut porterhouse roast.
02.24 Cut beef short plate.
02.25 Cut wedge bone sirloin steak.
02.26 Cut flat bone sirloin steak.
02.27 Cut pin bone sirloin steaks.
02.28 Cut beef sweet breads.
02.29 Cut boneless tip roast.
02.30 Cut tip steaks.

02.31 Cut beef tripe.
02.32 Cut ox tails.
02.33 Pull beef tenderloin (filet).
02.34 Shape beef roasts with string.
02.35 Strip the loin.
02.36 Tenderize beef chemically.
02.37 Tenderize beef by machine.
02.38 Make ground beef.
02.39 Cut special cuts.
02.40 Make new cuts.
02.41 Describe various beef items to customers.
02.42 Label beef in the display case.
02.43 Receive customer orders by telephone.
02.44 Re-wrap packages for self-service display case.
02.45 Rotate beef in display cases.
02.46 Set up self-service beef display.
02.47 Stock self-service beef displays.
02.48 Wrap beef for customers' home freezers.
02.49 Wrap packages for self-service display cases.

03.0 PREPARE PORK FOR RETAIL DISPLAY--The student will be able to:

03.01 Bone pork.
03.02 Cut and prepare pork brains.
03.03 Cut bacon (side pork).
03.04 Cut blade bones.
03.05 Cut boston shoulder.
03.06 Cut breast bones.
03.07 Cut carcass into wholesale pork cuts.
03.08 Cut clear plate.
03.09 Cut cracklings.
03.10 Cut fat back.
03.11 Cut jowl.
03.12 Cut leaf fat.
03.13 Cut picnic shoulder.
03.14 Cut pigs feet.
03.15 Cut pork cheeks.
03.16 Cut pork ears.
03.17 Cut pork fries.
03.18 Cut pork head.
03.19 Cut pork heart.
03.20 Cut pork kidney.
03.21 Cut pork lips.
03.22 Cut pork liver.
03.23 Cut pork loin.
03.24 Cut pork neckbones.
03.25 Cut pork skin.
03.26 Cut pork snouts.
03.27 Cut pork spareribs.
03.28 Cut pork tails.
03.29 Cut pork tongue.
03.30 Cut salt pork.
03.31 Cut smoked or fresh pork leg.
03.32 Shape pork roasts with string.
03.33 Slice ham electrically.
03.34 Slice ham manually.
03.35 Cut pork cutlets.
03.36 Tenderize pork.
03.37 Make boudin.
03.38 Make hog head cheese.
03.39 Make sausage.
03.40 Ground pork.

03.41 Hang and smoke prime.
03.42 Hang and smoke hams.
03.43 hang and smoke bacon.
03.44 Hang and smoke neckbones.
03.45 Hang and smoke hocks.
03.46 Hang and smoke sausage.
03.47 Make smoked sausage.
03.48 Cut smoked slab bacon.
03.49 Check for different size cuts.
03.50 Check for different size packages.
03.51 Describe various pork items to customers.
03.52 Label pork in the display case.
03.53 Receive customer orders by telephone.
03.54 Re-wrap packages for self-service display case.
03.55 Rotate pork in display cases.
03.56 Set up self-service pork display.
03.57 Stock self-service pork display.
03.58 Wrap pork for customers' home freezers.
03.59 Wrap packages for self-service display cases.

04.0 PREPARE POULTRY FOR RETAIL DISPLAY--The student will be able to:

04.01 Shape a whole chicken.
04.02 Split a chicken.
04.03 Quarter a chicken.
04.04 Remove and fold wings.
04.05 Remove and display thighs and drumsticks.
04.06 Bone a thigh.
04.07 Separate the back from the breast.
04.08 Prepare necks for display.
04.09 Prepare giblets for display.
04.10 Prepare a tray pack for a complete chicken.

05.0 PREPARE VARIETY MEATS (OFFALS) FOR RETAIL DISPLAY--The student will be able to:

05.01 Identify various variety meats for the customer.
05.02 Label variety meats in the display case.
05.03 Arrange a variety meat display.
05.04 Wrap variety meats for self-service display.

06.0 PREPARE CUSTOM CUTS FOR SPECIAL ORDERS--The student will be able to:

06.01 Describe various meat items to the customer.
06.02 Demonstrate communication skills with the customer.
06.03 Receive special orders by telephone.
06.04 Wrap meats for customers home freezer.

07.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN MEAT PRESERVATION, GRINDING, AND RETAIL PACKAGING AND PRICING--The student will be able to:

07.01 Demonstrate an understanding of how to control air circulation in storage areas.
07.02 Know how to control the temperature of a storage area.
07.03 Handle carcasses in the cooler.
07.04 Handle retail meat in the cooler.
07.05 Quick freeze meats.
07.06 Rotate meats in the storage area.
07.07 Determine the fineness or coarseness of the meat to be ground.
07.08 Select the proper grinding plate.
07.09 Inspect the meat for bone.
07.10 Properly and safely grind the meat.

07.11 Wrap the meat for self-service display.

08.0 PREPARE VEAL AND BABY BEEF FOR RETAIL DISPLAY--The student will be able to:

08.01 Bone veal.
08.02 Cut and prepare veal brains.
08.03 Cut calf fries.
08.04 Cut carcass into wholesale cuts of veal.
08.05 Cut veal breast.
08.06 Cut whole veal breast, bone in.
08.07 Debone whole veal breast.
08.08 Cut veal by machine.
08.09 Cut veal flank.
08.10 Cut veal heart.
08.11 Cut veal kidney.
08.12 Cut veal liver.
08.13 Cut veal loin.
08.14 Cut veal standing rib roast.
08.15 Cut veal rib steaks.
08.16 Cut full veal round.
08.17 Cut veal round.
08.18 Cut heel of round.
08.19 Cut veal shanks.
08.20 Cut veal shoulder.
08.21 Cut wedge bone sirloin steak.
08.22 Cut flat bone sirloin steaks.
08.23 Cut pin bone sirloin steaks.
08.24 Cut veal sweet breads.
08.25 Cut veal tongue.
08.26 Tenderize veal chemically.
08.27 Tenderize veal by machine.
08.28 Cut veal cutlets.
08.29 Grind veal.
08.30 Describe various veal items to customers.
08.31 Label veal in the display case.
08.32 Receive customer orders by telephone.
08.33 Re-wrap packages for self-service display case.
08.34 Rotate veal in display cases.
08.35 Set up self-service veal display.
08.36 Stock self-service veal display.
08.37 Wrap veal for customers' home freezers.
08.38 Wrap packages for self-service display cases.

09.0 PREPARE LAMB FOR RETAIL DISPLAY--The student will be able to:

09.01 Bone lamb.
09.02 Cube lamb.
09.03 Cut breast.
09.04 Cut carcass into warehouse cuts of lamb.
09.05 Cut lamb flank.
09.06 Cut lamb fries.
09.07 Cut lamb heart.
09.08 Cut lamb foreshank.
09.09 Cut lamb hindshank.
09.10 Cut lamb kidney.
09.11 Cut lamb liver.
09.12 Cut lamb loin.
09.13 Cut lamb neck.
09.14 Cut lamb rib.
09.15 Cut lamb shoulder.
09.16 Cut lamb sirloin.

09.17 Cut lamb tongue.
09.18 Cut leg of lamb.
09.19 Cut lamb short plate.
09.20 Grind lamb patties.
09.21 Cut special cuts.
09.22 Describe various lamb items to customers.
09.23 Label lamb in the display case.
09.24 Receive customer orders by telephone.
09.25 Re-wrap packages for self-service display case.
09.26 Rotate lamb in display cases.
09.27 Set up self-service lamb display.
09.28 Stock self-service lamb display.
09.29 Wrap lamb for customers' home freezers.
09.30 Wrap packages for self-service display cases.

10.0 PREPARE FISH AND SEAFOOD FOR RETAIL DISPLAY--The student will be able to:

10.01 Identify some of the more common varieties of finfish such as bass, grouper, flounder, mackerel, mullet, snapper, croaker, trout, bluefish, shad, perch, salmon, tuna, eel, anchovy, catfish, cod, and haddock.
10.02 Identify some of the more common varieties of shellfish such as crabs, lobster, crawfish, shrimp, oysters, clams, scallops, abalone, conch, and squid.
10.03 Group shellfish as mollusks or crustaceans.
10.04 Identify various species of shrimp.
10.05 Identify various species of crab.
10.06 Identify various species of lobster.
10.07 Identify the gills, pelvic fins, pectoral fin, anal fin, and dorsal fin of a fish.
10.08 Gill and gut a fish.
10.09 Scale a fish.
10.10 Skin a fish.
10.11 Fillet a fish and steak a fish.
10.12 Explain the causes for deterioration of seafood.
10.13 Inspect and receive (or reject) a seafood shipment from a supplier.
10.14 Inspect the fill area, eyes, and belly cavity of a finfish for evidence of bacteria growth.
10.15 Demonstrate the ability to monitor proper temperature control when receiving, storing, and displaying seafood.
10.16 Prepare detailed records of seafood received, stored, disposed of, and sold.
10.17 Manage a self-service seafood department.
10.18 Frequently monitor display case temperature.
10.19 Rotate products for shortest shelf life.
10.20 Identify and use special seafood wrapping materials.
10.21 Group the seafood by taste, species, and availability.
10.22 Manage a full service seafood department.
10.23 Sanitize a seafood display case.
10.24 Prepare a wet pan for displaying seafood.
10.25 Prepare an attractive wet pan seafood display.
10.26 Prepare and monitor a full seafood display case.
10.27 Prepare a product removal report (dump sheet).
10.28 Manage a frozen seafood display.
10.29 Monitor temperature at -10°F or lower.
10.30 Inspect packaging materials for good general condition and tight fit.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.

15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Meat Cutting
PROGRAM NUMBER: 8763300

COURSE TITLE: Meat Cutting 1
COURSE NUMBER: 8763310

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

01.01 Identify, use, clean, and maintain scales.
01.02 Identify, use, clean, and maintain slicing machine.
01.03 Identify, use, clean, and maintain meat tenderizers.
01.04 Identify, use, clean, and maintain meat grinders.
01.05 Identify, use, clean, and maintain meat saws.
01.06 Identify, use, clean, and maintain knives.
01.07 Identify, use, clean, and maintain oilstones.
01.08 Identify, use, clean, and maintain display cases.
01.09 Maintain clean work area.
01.10 Disconnect equipment from electrical source when performing maintenance and adjustments.
01.11 Use and maintain safety guards properly.

02.0 PREPARE BEEF FOR RETAIL DISPLAY--The student will be able to:

02.01 Bone beef.
02.02 Break beef forequarter and hindquarter.
02.03 Cube beef by machine.
02.04 Cut and prepare beef brains.
02.05 Cut and prepare beef heart.
02.06 Cut and prepare beef liver.
02.07 Cut and prepare beef tongue.
02.08 Slice beef brisket.
02.09 Cut whole beef brisket, bone in.
02.10 Debone whole beef brisket.
02.11 Cut beef carcass into wholesale cuts.
02.12 Cut beef chuck.
02.13 Cut beef flank.
02.14 Cut beef foreshank.
02.15 Cut beef kidneys.
02.16 Cut standing rib roast.
02.17 Cut rib steaks.
02.18 Cut full beef round.
02.19 Cut beef round.
02.20 Cut heel of round.
02.21 Cut hind shank.
02.22 Cut porterhouse steak.
02.23 Cut porterhouse roast.
02.24 Cut beef short plate.
02.25 Cut wedge bone sirloin steak.
02.26 Cut flat bone sirloin steak.
02.27 Cut pin bone sirloin steaks.
02.28 Cut beef sweet breads.
02.29 Cut boneless tip roast.
02.30 Cut tip steaks.
02.31 Cut beef tripe.
02.32 Cut ox tails.
02.33 Pull beef tenderloin (filet).
02.34 Shape beef roasts with string.

02.35 Strip the loin.
02.36 Tenderize beef chemically.
02.37 Tenderize beef by machine.
02.38 Make ground beef.
02.39 Cut special cuts.
02.40 Make new cuts.
02.41 Describe various beef items to customers.
02.42 Label beef in the display case.
02.43 Receive customer orders by telephone.
02.44 Re-wrap packages for self-service display case.
02.45 Rotate beef in display cases.
02.46 Set up self-service beef display.
02.47 Stock self-service beef displays.
02.48 Wrap beef for customers' home freezers.
02.49 Wrap packages for self-service display cases.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Meat Cutting — PROGRAM NUMBER: 8763300

COURSE TITLE: Meat Cutting 2 — COURSE NUMBER: 8763320

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

Repeat the skills reflected in Student Performance Standards 01.01 - 01.12.

03.0 PREPARE PORK FOR RETAIL DISPLAY--The student will be able to:

03.01 Bone pork.
03.02 Cut and prepare pork brains.
03.03 Cut bacon (side pork).
03.04 Cut blade bones.
03.05 Cut boston shoulder.
03.06 Cut breast bones.
03.07 Cut carcass into wholesale pork cuts.
03.08 Cut clear plate.
03.09 Cut cracklings.
03.10 Cut fat back.
03.11 Cut jowl.
03.12 Cut leaf fat.
03.13 Cut picnic shoulder.
03.14 Cut pigs feet.
03.15 Cut pork cheeks.
03.16 Cut pork ears.
03.17 Cut pork fries.
03.18 Cut pork head.
03.19 Cut pork heart.
03.20 Cut pork kidney.
03.21 Cut pork lips.
03.22 Cut pork liver.
03.23 Cut pork loin.
03.24 Cut pork neckbones.
03.25 Cut pork skin.

03.26 Cut pork snouts.
03.27 Cut pork spareribs.
03.28 Cut pork tails.
03.29 Cut pork tongue.
03.30 Cut salt pork.
03.31 Cut smoked or fresh pork leg.
03.32 Shape pork roasts with string.
03.33 Slice ham electrically.
03.34 Slice ham manually.
03.35 Cut pork cutlets.
03.36 Tenderize pork.
03.37 Make boudin.
03.38 Make hog head cheese.
03.39 Make sausage.
03.40 Ground pork.
03.41 Hang and smoke prime.
03.42 Hang and smoke hams.
03.43 Hang and smoke bacon.
03.44 Hang and smoke neckbones.
03.45 Hang and smoke hocks.
03.46 Hang and smoke sausage.
03.47 Make smoked sausage.
03.48 Cut smoked slab bacon.
03.49 Check for different size cuts.
03.50 Check for different size packages.
03.51 Describe various pork items to customers.
03.52 Label pork in the display case.
03.53 Receive customer orders by telephone.
03.54 Re-wrap packages for self-service display case.
03.55 Rotate pork in display cases.
03.56 Set up self-service pork display.
03.57 Stock self-service pork display.
03.58 Wrap pork for customers' home freezers.
03.59 Wrap packages for self-service display cases.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Meat Cutting — PROGRAM NUMBER: 8763300

COURSE TITLE: Meat Cutting 3 — COURSE NUMBER: 8763330

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

Repeat the skills reflected in Student Performance Standards 01.01 - 01.12.

04.0 PREPARE POULTRY FOR RETAIL DISPLAY--The student will be able to:

04.01 Shape a whole chicken.
04.02 Split a chicken.
04.03 Quarter a chicken.
04.04 Remove and fold wings.
04.05 Remove and display thighs and drumsticks.
04.06 Bone a thigh.

04.07 Separate the back from the breast.
04.08 Prepare necks for display.
04.09 Prepare giblets for display.
04.10 Prepare a tray pack for a complete chicken.

05.0 PREPARE VARIETY MEATS (OFFALS) FOR RETAIL DISPLAY--The student will be able to:

05.01 Identify various variety meats for the customer.
05.02 Label variety meats in the display case.
05.03 Arrange a variety meat display.
05.04 Wrap variety meats for self-service display.

07.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN MEAT PRESERVATION, GRINDING, AND RETAIL PACKAGING AND PRICING--The student will be able to:

07.01 Demonstrate an understanding of how to control air circulation in storage areas.
07.02 Know how to control the temperature of a storage area.
07.03 Handle carcasses in the cooler.
07.04 Handle retail meat in the cooler.
07.05 Quick freeze meats.
07.06 Rotate meats in the storage area.
07.07 Determine the fineness or coarseness of the meat to be ground.
07.08 Select the proper grinding plate.
07.09 Inspect the meat for bone.
07.10 Properly and safely grind the meat.
07.11 Wrap the meat for self-service display.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Meat Cutting
PROGRAM NUMBER: 8763300

COURSE TITLE: Meat Cutting 4
COURSE NUMBER: 8763340

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

01.12 Use proper safety precautions when sharpening knives.
01.13 Clean and sanitize concrete surfaces.
01.14 Clean and sanitize glass surfaces.
01.15 Clean and sanitize metal surfaces.
01.16 Clean and sanitize porcelain surfaces.
01.17 Clean and sanitize tile surfaces.
01.18 Clean and sanitize wood surfaces.

08.0 PREPARE VEAL AND BABY BEEF FOR RETAIL DISPLAY--The student will be able to:

08.01 Bone veal.
08.02 Cut and prepare veal brains.
08.03 Cut calf fries.
08.04 Cut carcass into wholesale cuts of veal.
08.05 Cut veal breast.
08.06 Cut whole veal breast, bone in.

08.07 Debone whole veal breast.
08.08 Cut veal by machine.
08.09 Cut veal flank.
08.10 Cut veal heart.
08.11 Cut veal kidney.
08.12 Cut veal liver.
08.13 Cut veal loin.
08.14 Cut veal standing rib roast.
08.15 Cut veal rib steaks.
08.16 Cut full veal round.
08.17 Cut veal round.
08.18 Cut heel of round.
08.19 Cut veal shanks.
08.20 Cut veal shoulder.
08.21 Cut wedge bone sirloin steak.
08.22 Cut flat bone sirloin steaks.
08.23 Cut pin bone sirloin steaks.
08.24 Cut veal sweet breads.
08.25 Cut veal tongue.
08.26 Tenderize veal chemically.
08.27 Tenderize veal by machine.
08.28 Cut veal cutlets.
08.29 Grind veal.
08.30 Describe various veal items to customers.
08.31 Label veal in the display case.
08.32 Receive customer orders by telephone.
08.33 Re-wrap packages for self-service display case.
08.34 Rotate veal in display cases.
08.35 Set up self-service veal display.
08.36 Stock self-service veal display.
08.37 Wrap veal for customers' home freezers.
08.38 Wrap packages for self-service display cases.

09.0 PREPARE LAMB FOR RETAIL DISPLAY--The student will be able to:

09.01 Bone lamb.
09.02 Cube lamb.
09.03 Cut breast.
09.04 Cut carcass into warehouse cuts of lamb.
09.05 Cut lamb flank.
09.06 Cut lamb fries.
09.07 Cut lamb heart.
09.08 Cut lamb foreshank.
09.09 Cut lamb hindshank.
09.10 Cut lamb kidney.
09.11 Cut lamb liver.
09.12 Cut lamb loin.
09.13 Cut lamb neck.
09.14 Cut lamb rib.
09.15 Cut lamb shoulder.
09.16 Cut lamb sirloin.
09.17 Cut lamb tongue.
09.18 Cut leg of lamb.
09.19 Cut lamb short plate.
09.20 Grind lamb patties.
09.21 Cut special cuts.
09.22 Describe various lamb items to customers.
09.23 Label lamb in the display case.
09.24 Receive customer orders by telephone.
09.25 Re-wrap packages for self-service display case.
09.26 Rotate lamb in display cases.
09.27 Set up self-service lamb display.

09.28 Stock self-service lamb display.
09.29 Wrap lamb for customers' home freezers.
09.30 Wrap packages for self-service display cases.

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STUDENT PERFORMANCE STANDARDS

PROGRAM AREA:	Industrial	EFFECTIVE DATE:	July, 1993
		COURSE CREDIT:	1
PROGRAM TITLE:	Meat Cutting	PROGRAM NUMBER:	8763300
COURSE TITLE:	Meat Cutting 5	COURSE NUMBER:	8763350

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

Repeat the skills reflected in Student Performance Standards 01.13 - 01.18.

10.0 PREPARE FISH AND SEAFOOD FOR RETAIL DISPLAY--The student will be able to:

10.01 Identify some of the more common varieties of finfish such as bass, grouper, flounder, mackerel, mullet, snapper, croaker, trout, bluefish, shad, perch, salmon, tuna, eel, anchovy, catfish, cod, and haddock.
10.02 Identify some of the more common varieties of shellfish such as crabs, lobster, crawfish, shrimp, oysters, clams, scallops, abalone, conch, and squid.
10.03 Group shellfish as mollusks or crustaceans.
10.04 Identify various species of shrimp.
10.05 Identify various species of crab.
10.06 Identify various species of lobster.
10.07 Identify the gills, pelvic fins, pectoral fin, anal fin, and dorsal fin of a fish.
10.08 Gill and gut a fish.
10.09 Scale a fish.
10.10 Skin a fish.
10.11 Fillet a fish and steak a fish.
10.12 Explain the causes for deterioration of seafood.
10.13 Inspect and receive (or reject) a seafood shipment from a supplier.
10.14 Inspect the fill area, eyes, and belly cavity of a finfish for evidence of bacteria growth.
10.15 Demonstrate the ability to monitor proper temperature control when receiving, storing, and displaying seafood.
10.16 Prepare detailed records of seafood received, stored, disposed of, and sold.
10.17 Manage a self-service seafood department.
10.18 Frequently monitor display case temperature.
10.19 Rotate products for shortest shelf life.
10.20 Identify and use special seafood wrapping materials.
10.21 Group the seafood by taste, species, and availability.
10.22 Manage a full service seafood department.
10.23 Sanitize a seafood display case.
10.24 Prepare a wet pan for displaying seafood.
10.25 Prepare an attractive wet pan seafood display.
10.26 Prepare and monitor a full seafood display case.

10.27 Prepare a product removal report (dump sheet).
10.28 Manage a frozen seafood display.
10.29 Monitor temperature at -10°F or lower.
10.30 Inspect packaging materials for good general condition and tight fit.

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Meat Cutting	PROGRAM NUMBER:	8763300
COURSE TITLE:	Meat Cutting 6	COURSE NUMBER:	8763360

COURSE DESCRIPTION:

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

Repeat the skills reflected in Student Performance Standards 01.13 - 01.18.

06.0 PREPARE CUSTOM CUTS FOR SPECIAL ORDERS--The student will be able to:

06.01 Describe various meat items to the customer.
06.02 Demonstrate communication skills with the customer.
06.03 Receive special orders by telephone.
06.04 Wrap meats for customers home freezer.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Mechanical Design Technology

CODE NUMBER: Secondary ______ Postsecondary I150805

Florida CIP 0615.080500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: TEC MECH @ 7 G TEC DRAFT @ 7 G
DRAFTING @ 7 G METAL WORK @7 G
¶BLD CONST @7 G ¶TEC CONST @7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as mechanical design technicians, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, skills necessary to assist mechanical-design or equipment-systems engineers in designing, detailing, producing, and testing machines using appropriate available materials, processes, techniques, and facilities.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting, manufacturing and fabrication procedures, machine design, material testing, quality control, mechanics, and technical reporting.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Completion of the drafting core program (8724000, I480101) is a prerequisite for entry into this specialized program. Students who have satisfactorily completed Advanced Drafting (8726000) shall be exempt from repeating up to 300 hours of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee.

This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours in addition to completion of the core program.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply advanced drafting skills.
02. Apply advanced dimensioning skills.
03. Utilize drafting applications.
04. Prepare advanced technical drawings.
05. Prepare advanced computer aided drawings.
06. Read, analyze, interpret, and write technical reports.
07. Prepare basic hydraulic drawings.
08. Prepare mechanical drawings.
09. Prepare sheet metal drawings.
10. Demonstrate understanding of applied physics and mechanics.
11. Demonstrate understanding of strength of material.
12. Demonstrate understanding of quality control procedures.
13. Demonstrate understanding of manufacturing/fabricating processes.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Mechanical Design Technology POSTSECONDARY NUMBER: I150805

01.0 APPLY ADVANCED DRAFTING SKILLS--The student will be able to:

01.01 Use conversion tables for fractions, decimals and metric measurements for advanced applications.
01.02 Refine freehand and other lettering techniques.
01.03 Prepare pictorial drawings.

02.0 APPLY ADVANCED DIMENSIONING SKILLS--The student will be able to:

02.01 Prepare drawings containing linear, angular, and circular standard dimensions.
02.02 Prepare drawings using metric dimensions.
02.03 Prepare drawings using advanced dimensioning techniques.

03.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

03.01 Identify and use the various drafting and graphic appliques.
03.02 Use cut and paste techniques.
03.03 Prepare overlay drawings.
03.04 Make drawing changes on a sepia.
03.05 Apply inking techniques.
03.06 Utilize technical math skills.

04.0 PREPARE ADVANCED TECHNICAL DRAWINGS --The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal, vertical, and inclined surfaces; circles and/ or arcs.
04.03 Prepare drawings incorporating partial views, removed details, and conventional brakes.
04.04 Prepare drawings containing secondary auxiliary views.
04.05 Prepare a sectional assembly drawing applying material symbols.

05.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

05.01 Refine hardware/software skills.
05.02 Prepare CAD drawings.

06.0 READ, ANALYZE, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

06.01 Analyze content of technical report.
06.02 Prepare abstract of technical report.
06.03 Compose technical report.

07.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

07.01 Prepare piping drawings.
07.02 Prepare pump and motor drawings.
07.03 Prepare cylinder and piston diagrams.
07.04 Prepare valve drawings.
07.05 Prepare pump section drawings.
07.06 Prepare pulley and chain drive drawings.

08.0 PREPARE MECHANICAL DRAWINGS--The student will be able to:

08.01 Identify machine shop equipment (lathe, mill, punch, etc.) and interpret their applications.
08.02 Construct detail drawings of parts to be produced by various shop equipment.
08.03 Demonstrate functional application of tolerancing related to material used.
08.04 Demonstrate functional application of tolerancing related to method of production.
08.05 Demonstrate functional application of tolerancing related to interface with mating parts.
08.06 Construct an orthographic assembly/sub-assembly drawings.
08.07 Detail components of orthographic assembly/sub-assembly drawings.
08.08 Construct an isometric assembly/sub-assembly drawing.
08.09 Produce a parts list for an assembly drawing.
08.10 Construct a casting drawing.
08.11 Construct a jig drawing.
08.12 Construct a fixture drawing.
08.13 Construct a working drawing of a plate cam.
08.14 Choose materials to specification for given service considering corrosion effects (metal to metal, metal to environment, etc.) (marine).
08.15 Construct HVAC drawings and sizing (marine).
08.16 Calculate gear formulas.
08.17 Construct a working drawing of a spur gear.
08.18 Construct a sheet metal drawing showing development.
08.19 Construct an injection mold drawing.
08.20 Construct a drawing specifically intended for use with C.N.C. machining.
08.21 Construct individual component PC part drawings, including dimensioning and proper tolerancing, from a sketch of the composite machine.
08.22 Make a three-dimensional sketch of a component from its verbal description.
08.23 Show proper use of welding symbols.
08.24 Show proper use of surface finishes and symbols.
08.25 Demonstrate proper and reasonable use of tolerance of dimensions.
08.26 Construct a drawing which shows proper use of different types of fasteners.
08.27 Correct a drawing which lacks information.

09.0 PREPARE SHEET METAL DRAWINGS--The student will be able to:

09.01 Construct sheet metal symbols.
09.02 Produce representative sheet metal drawings.
09.03 Prepare bill of materials.
09.04 Read and interpret applicable local/state/federal codes.

10.0 DEMONSTRATE UNDERSTANDING OF APPLIED PHYSICS AND MECHANICS--The student will be able to:

10.01 Apply and solve vectors.
10.02 Solve force and motion problems.
10.03 Solve work, energy and power problems.
10.04 Solve friction problems.
10.05 Solve circular motion problems.
10.06 Solve rotational motion problems.
10.07 Solve problems involving the properties or solids.
10.08 Solve problems involving the properties of liquids.
10.09 Solve problems involving the properties of gases.
10.10 Solve temperature and heat problems.
10.11 Solve change-of-state problems.
10.12 Solve heat transfer problems.

10.13 Solve thermodynamic problems.
10.14 Solve problems with refrigeration and air conditioning.
10.15 Solve harmonic motion problems.
10.16 Solve sound wave problems.
10.17 Solve light problems.
10.18 Solve optical problems.
10.19 Solve electric circuit problems.
10.20 Solve electro-magnet problems.
10.22 Solve problems about generators motors.
10.23 Solve electrostatic problems.
10.24 Solve magnetism problems.

11.0 DEMONSTRATE UNDERSTANDING OF STRENGTH OF MATERIAL--The student will be able to:

11.01 Solve equilibrium problems.
11.02 Solve stress and strain problems.
11.03 Solve centroid and inertia problems.
11.04 Solve connection/joint problems.
11.05 Solve problems with beam stresses.
11.06 Solve torsion problems.
11.07 Solve compression problems.
11.08 Solve tension problems.
11.09 Solve force combination problems.

12.0 DEMONSTRATE UNDERSTANDING OF QUALITY CONTROL PROCEDURES--The student will be able to:

12.01 Demonstrate and develop understanding of preset standards.
12.02 Match product to preset standards.
12.03 Evaluate product by preset characteristics.

13.0 DEMONSTRATE UNDERSTANDING OF MANUFACTURING/FABRICATING PROCESSES--The student will be able to:

13.01 Identify manufacturing/fabricating processes.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Mechanical Drafting

CODE NUMBER: Secondary ______ Postsecondary 1480105

Florida CIP 0648.010500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230), or mechanical drafters (007.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, mathematical skills, safe and efficient work practices, and the development of detailed working drawings and related specifications for mechanical devices and machinery including production drawings, jigs and fixtures, tools and dies, pneumatic/hydraulic applications and advanced computer aided drawings.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, office reproduction equipment, drafting tools, computer aided design systems, drafting track, technical publication and reference materials, and drafting materials/supplies common to industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is one of many appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Completion of the 900 hour core Drafting program is a prerequisite for entry into this postsecondary specialization program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

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To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours in addition to completion of the core Drafting program.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare advanced mechanical drawings.
02. Prepare production drawings.
03. Prepare basic pneumatic/hydraulic drawings.
04. Prepare tool drawings.
05. Prepare advanced computer aided drawings.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate and understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Mechanical Drafting POSTSECONDARY NUMBER: I480105

01.0 PREPARE ADVANCED MECHANICAL DRAWINGS--The student will be able to.

01.01 Resolve problems by descriptive geometry and revolutions.
01.02 Prepare advance surface drawings.
01.03 Identify the various manufacturing methods.
01.04 Use precision dimensioning to include geometric characters.
01.05 Make engineering changes on drawings.
01.06 Prepare fastener drawings.
01.07 Prepare cam calculations and drawings.
01.08 Prepare gear calculations.
01.09 Prepare spring calculations and drawings.

02.0 PREPARE PRODUCTION DRAWINGS--The student will be able to.

02.01 Make a design layout drawing.
02.02 Make detail drawings.
02.03 Make pattern shop detail drawings.
02.04 Make casting drawings.
02.05 Make forging detail drawings.
02.06 Make machining detail drawings.
02.07 Make stamping drawings.
02.08 Make welding drawings.
02.09 Make assembly drawings.
02.10 Prepare installation drawings.

03.0 PREPARE PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to.

03.01 Prepare piping drawings.
03.02 Prepare pictorial drawings.
03.03 Prepare sectional drawings.
03.04 Prepare diagrams.

04.0 PREPARE TOOL DRAWINGS--The student will be able to.

04.01 Design jigs and fixtures.
04.02 Design cutting dies.
04.03 Design forming dies.

05.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to.

05.01 Prepare advanced mechanical drawings.
05.02 Prepare production drawings.
05.03 Prepare tool drawings.
05.04 Prepare pneumatic/hydraulic drawings.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.

06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
09.11 Identify or demonstrate acceptable personal grooming habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.
10.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Mechanical Drafting Skills

CODE NUMBER: Secondary 8725100 Postsecondary ______

Florida CIP 0648.010102

SECONDARY SCHOOL CREDITS 2 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 ____ Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: DRAFTING @ 7 G TEC DRAFT @ 7 G
¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (22514230), or junior mechanical drafters.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint machine operation, use of drafting tools and equipment, drafting skills, charts and graphs, computer aided drawings, and technical mathematics.

Listed below are the courses that comprise this program when offered at the secondary level:

8725110	Mechanical Drafting Skills 1
8725120	Mechanical Drafting Skills 2

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, drafting tools, CAD systems, drafting tracks, blueprint machine materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Completion of the Drafting Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization area concurrently may be necessary.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare assembly drawing.
02. Prepare detail drawings.
03. Prepare surface drawings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER: 8725100
PROGRAM TITLE: Mechanical Drafting Skills POSTSECONDARY NUMBER:

01.0 PREPARE ASSEMBLY DRAWING--The student will be able to:

01.01 Apply geometric dimensioning and tolerancing.
01.02 Apply standards.
01.03 Prepare a sectional-assembly drawing applying material symbols.
01.04 Prepare drawings containing auxiliary sections.
01.05 Prepare drawings containing secondary auxiliary view.
01.06 Produce drawings manually and electronically.

02.0 PREPARE DETAIL DRAWINGS--The student will be able to:

02.01 Prepare fastener drawing.
02.02 Prepare gear drawing.
02.03 Prepare cam drawing.
02.04 Prepare drawings containing offset sections.
02.05 Prepare drawings containing revolved sections.
02.06 Prepare drawings containing removed sections and broken-out sections.
02.07 Produce drawings manually and electronically.

03.0 PREPARE SURFACE DRAWINGS--The student will be able to:

03.01 Prepare drawings with stretchouts of prisms, cylinders, cones and pyramids.
03.02 Prepare stretch of a transitions piece.
03.03 Prepare drawings involving intersecting pieces.
03.04 Produce drawings manually and electronically.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Mechanical Drafting Skills PROGRAM NUMBER: 8725100

COURSE TITLE: Mechanical Drafting Skills 1 COURSE NUMBER: 8725110

COURSE DESCRIPTION:

02.0 PREPARE DETAIL DRAWINGS--The student will be able to:

02.01 Prepare fastener drawing.
02.02 Prepare gear drawing.
02.03 Prepare cam drawing.
02.04 Prepare drawings containing offset sections.
02.05 Prepare drawings containing revolved sections.
02.06 Prepare drawings containing removed sections and broken-out sections.
02.07 Produce drawings manually and electronically.

03.0 PREPARE SURFACE DRAWINGS--The student will be able to:

03.01 Prepare drawings with stretchouts of prisms, cylinders, cones and pyramids.
03.02 Prepare stretch of a transitions piece.
03.03 Prepare drawings involving intersecting pieces.
03.04 Produce drawings manually and electronically.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Mechanical Drafting Skills PROGRAM NUMBER: 8725100

COURSE TITLE: Mechanical Drafting Skills 2 COURSE NUMBER: 8725120

COURSE DESCRIPTION:

01.0 PREPARE ASSEMBLY DRAWING--The student will be able to:

01.01 Apply geometric dimensioning and tolerancing..
01.02 Apply standards.
01.03 Prepare a sectional-assembly drawing applying material symbols.
01.04 Prepare drawings containing auxiliary sections.
01.05 Prepare drawings containing secondary auxiliary view.
01.06 Produce drawings manually and electronically.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Metal Fabricated Building Construction

CODE NUMBER: Secondary ______ Postsecondary 1469949

Florida CIP 0646.999904

SECONDARY
SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __X__

APPLICABLE LEVEL(S): ______7-9 ______9-12 __X__Postsecondary Adult Vocational

______ Postsecondary Vocational __X__ Other __30, 31

CERTIFICATION COVERAGE: METAL WORK @ 7 G STRL STEEL @ 7 G
BLDG CONST @ 7 G TEC CONSTR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as metal building assemblers, or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes but is not limited to, employability skills, safe and efficient work practices, screened porches, screened enclosures, screened roof enclosures, preformed panel-post and beam roofs, mobile home panel roofovers, residential glass window enclosures, vinyl panel window enclosures, single story self-contained aluminum utility structures (not to exceed 500 square feet), siding, soffit, fascia, gutters and masonry concrete work limited to foundations, slabs and block kneewalls incidental to the aluminum and allied materials construction industry.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in using tools and equipment; building, installing and repairing aluminum structures; installing repairing windows, hanging and repairing doors, installing and repairing roofovers, installing and repairing nonstructural aluminum, and estimating and bidding.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills required for this postsecondary adult vocational program is: Mathematics 9.0 and Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated

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basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in basic trade skills.
02. Demonstrate proficiency in applying building and zoning requirements.
03. Demonstrate proficiency in setting a foundation.
04. Demonstrate proficiency in constructing and repairing wall sections under solid roofs.
05. Demonstrate proficiency in installing and repairing aluminum roof sections.
06. Demonstrate proficiency in constructing, and repairing screened roof enclosures.
07. Demonstrate proficiency in installing and repairing vinyl and glass windows.
08. Demonstrate proficiency in hanging and repairing doors.
09. Demonstrate proficiency in installing and repairing post and beam structures.
10. Demonstrate proficiency in installing and repairing roofovers.
11. Demonstrate proficiency in installing and repairing railings and decorative fencing.
12. Demonstrate proficiency in installing and repairing non-structural materials.
13. Demonstrate proficiency in estimating and bidding.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial		SECONDARY NUMBER:

PROGRAM TITLE: Metal Fabricated Building Construction		POSTSECONDARY NUMBER: 1469949

01.0 DEMONSTRATE PROFICIENCY IN BASIC TRADE SKILLS--The student will be able to:

01.01 Identify characteristics and uses of aluminum.
01.02 Apply basic mathematical skills.
01.03 Follow safety practices.
01.04 Utilize measuring tools.
01.05 Operate hand and power tools.
01.06 Perform basic surveying skills.
01.07 Transport aluminum materials and supplies.
01.08 Handle and store aluminum products.
01.09 Read and interpret basic job prints.

02.0 DEMONSTRATE PROFICIENCY IN APPLYING BUILDING AND ZONING REQUIREMENTS--The student will be able to:

02.01 Follow code requirements for aluminum construction.
02.02 Identify zoning and building permit requirements.

03.0 DEMONSTRATE PROFICIENCY IN SETTING A FOUNDATION--The student will be able to:

03.01 Place a concrete slab on grade.
03.02 Place a concrete slab for masonry kneewall.
03.03 Place a continuous wall footing.
03.04 Place a pier-type post footing.
03.05 Place a concrete block kneewall.

04.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING AND REPAIRING WALL SECTIONS UNDER SOLID ROOFS--The student will be able to:

04.01 Build screen wall.
04.02 Install screen wall
04.03 Build framed solid wall.
04.04 Install framed solid wall.
04.05 Build unitized metal panel wall.
04.06 Install unitized metal panel wall.
04.07 Repair wall sections.

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING ALUMINUM ROOF SECTIONS--The student will be able to:

05.01 Install standing seam roof.
05.02 Install/replace insulation.
05.03 Install a sandwich panel roof.
05.04 Repair aluminum roof sections.

06.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING, AND REPAIRING SCREENED ROOF ENCLOSURES--The student will be able to:

06.01 Read and interpret screened roof enclosure prints.
06.02 Cut and build wall panel sections.
06.03 Cut and build roof panel sections.
06.04 Install wall and roof panel sections.
06.05 Install cables and bracing.

06.06 Repair screened roof enclosures.

07.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING VINYL AND GLASS WINDOWS--The student will be able to:

07.01 Install vinyl panel windows.
07.02 Install glass pane windows.
07.03 Replace glass pane windows.
07.04 Repair vinyl panel and glass pane windows.

08.0 DEMONSTRATE PROFICIENCY IN HANGING AND REPAIRING DOORS--The student will be able to:

08.01 Hang screen and glass doors.
08.02 Repair screen and glass doors.

09.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING POST AND BEAM STRUCTURES--The student will be able to:

09.01 Install post and beam structures under a wood roof.
09.02 Install post and beam structures under a metal roof.
09.03 Repair post and beam structures.

10.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING ROOFOVERS--The student will be able to:

10.01 Install raised metal standing seam roofovers.
10.02 Install flat down metal standing seam roofovers.
10.03 Install flat down metal laminated systems.
10.04 Install flat down vinyl/metal blanket roofovers.
10.05 Repair roofovers.

11.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING RAILINGS AND DECORATIVE FENCING--The student will be able to:

11.01 Build and install custom railings and decorative fencing.
11.02 Install pre-built railings and decorative fencing.
11.03 Repair railings and decorative fencing.

12.0 DEMONSTRATE PROFICIENCY IN INSTALLING AND REPAIRING NON-STRUCTURAL MATERIALS--The student will be able to:

12.01 Install gutters, downspouts and accessories.
12.02 Install firring strips.
12.03 Install siding.
12.04 Install soffit and fascia.
12.05 Shape aluminum flat stock.
12.06 Install window awnings and shutters.
12.07 Install skirting and decorative trim.
12.08 Repair and replace nonstructural materials.

13.0 DEMONSTRATE PROFICIENCY IN ESTIMATING AND BIDDING--The student will be able to:

13.01 Prepare a materials list.
13.02 Estimate labor hours.
13.03 Estimate variable costs.
13.04 Prepare written job estimates.
13.05 Present job estimate.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.

18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Metal Fabrication

CODE NUMBER: Secondary 8754300 Postsecondary ____________

Florida CIP 0648.051400

SECONDARY
SCHOOL CREDITS __6__ COLLEGE CREDITS ______ POSTSECONDARY ADULT
VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 __x__9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__Other __30, 31

CERTIFICATION COVERAGE: SHEETMETAL @ 7 G METAL WORK @ 7 G WELDING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as pattern and model makers (89114685) layout workers (809.281-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: measurement, layout, planning, design, sheetmetal work, structural steel, welding, mechanical fasteners, metal properties, heat treating and metalworking tools.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8754310	Metal Fabrication 1
8754320	Metal Fabrication 2
8754330	Metal Fabrication 3
8754340	Metal Fabrication 4
8754350	Metal Fabrication 5
8754360	Metal Fabrication 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: measuring and layout tools, bench metal operations, electric metal bonding operations, gas welding and cutting operations, sheetmetal operations, grinding and sharpening tools and metalworking machines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-

job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate basic metal fabrication skills.
02. Demonstrate ability to read plans and drawings.
03. Perform measuring and layout operations.
04. Describe metals and their properties.
05. Operate metalworking machines.
06. Perform metal fabrication operations.
07. Perform gas welding and cutting operations.
08. Perform electric metal-bonding operations.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate and practice employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1994

PROGRAM AREA: Industrial — SECONDARY NUMBER: 8754300

PROGRAM TITLE: Metal Fabrication — POSTSECONDARY NUMBER:

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety and operating rules and practices.
01.02 Maintain a clean and orderly shop.
01.03 Make job-related decimal and fraction calculations.
01.04 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts and tables.
01.07 Compute feet, inches and yards.
01.08 Use the protractor to measure angles to nearest degree.
01.09 Use the protractor and triangles to draw angles.
01.10 Demonstrate proper use of material handling techniques.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/detail views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint abbreviations.
02.06 Identify dimensioning of radii, round holes, fillets and chamfers.
02.07 Identify screw threads and bolt types.
02.08 Apply dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.

03.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gages and circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.
03.05 Read and measure with steel rules.
03.06 Read and measure with micrometers.
03.07 Read and measure with vernier height gages.
03.08 Read and measure with dial calipers.
03.09 Read and measure with universal bevel protractor.
03.10 Measure with sine bars.
03.11 Read and measure with dial indicators.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 Describe the steelmaking process.
04.02 Describe the differences between ferrous and non-ferrous metals.
04.03 Describe casting, alloys and forging.
04.04 Identify metals such as galvanized iron and steel, aluminum stainless steel, sheetmetal, copper and brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gages, shapes and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:
05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric and air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges and seams.
06.02 Use hand tools to cut, punch and shear metal.
06.03 Form sheetmetal using a brake, a folder, rolls and a turning machine.
06.04 Join metals using solder, rivets and mechanical fasteners.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gages and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame setting.s
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
07.07Setup and operate a plasma arc cutting machine.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
08.03 Setup and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning and maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips and choosing filler metal.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial   COURSE CREDIT: 1
PROGRAM TITLE: Metal Fabrication   PROGRAM NUMBER: 8754300
COURSE TITLE: Metal Fabrication 1   COURSE NUMBER: 8754310

COURSE DESCRIPTION:

This course is designed to familiarize the student with facilities, safety and housekeeping rules. The student will also become familiar with materials and specifications, skilled in using measuring and layout tools, developing patterns, reading drawings and making sketches.

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety and operating rules and practices.
01.02 Maintain a clean and orderly shop.
01.03 Make job-related decimal and fraction calculations.
01.04 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts and tables.
01.07 Compute feet, inches and yards.
01.08 Use the protractor to measure angles to nearest degree.
01.09 Use the protractor and triangles to draw angles.
01.10 Demonstrate proper use of material handling techniques.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/detail views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint abbreviations.
02.06 Identify dimensioning of radii, round holes, fillets and chamfers.
02.07 Identify screw threads and bolt types.
02.08 Apply dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.

03.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gages and circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.
03.05 Read and measure with steel rules.
03.06 Read and measure with micrometers.
03.07 Read and measure with vernier height gages.
03.08 Read and measure with dial calipers.
03.09 Read and measure with universal bevel protractor.
03.10 Measure with sine bars.
03.11 Read and measure with dial indicators.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able

to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Metal Fabrication	PROGRAM NUMBER: 8754300
COURSE TITLE: Metal Fabrication 2	COURSE NUMBER: 8754320

COURSE DESCRIPTION:

This course is designed to familiarize the students with the steelmaking process and help them identify ferrous and non-ferrous metals, castings, forgings, alloys and the gages, shapes and dimensions of purchased materials. The student will also learn to identify, care for and use metalworking machines.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 4Describe the steelmaking process.
04.02 Describe the differences between ferrous and non-ferrous metals.
04.03 Describe casting, alloys and forging.
04.04 Identify metals such as galvanized iron and steel, aluminum stainless steel, sheetmetal, copper and brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gages, shapes and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.

05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric and air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300
COURSE TITLE: Metal Fabrication 3 — COURSE NUMBER: 8754330

COURSE DESCRIPTION:

This course is designed to develop basic skills in basic metal fabrication operations.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges and seams.
06.02 Use hand tools to cut, punch and shear metal.
06.03 Form sheetmetal using a brake, a folder, rolls and a turning machine.
06.04 Join metals using solder, rivets and mechanical fasteners.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300
COURSE TITLE: Metal Fabrication 4 — COURSE NUMBER: 8754340

COURSE DESCRIPTION:

This course is designed to develop skills in the safe use of gas welding and cutting equipment.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gages and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame setting.s
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
07.07 Setup and operate a plasma arc cutting machine.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 5 — COURSE NUMBER: 8754350

COURSE DESCRIPTION:

This course is designed to develop skills in the safety and use of an arc welder and to familiarize the student with the basic procedures and the advantages of MIG and TIG welding.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an rc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
08.03 Setup and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning nd maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG elder, welding in various positions, selecting proper tips and choosing filler metal.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 6 — COURSE NUMBER: 8754360

COURSE DESCRIPTION:

This course is designed to help the students demonstrate employability and entrepreneurship skills.

12.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.

12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Micro Computer Electronics

CODE NUMBER: Secondary 8730200 Postsecondary ______

Florida CIP 0647.011400

SECONDARY
SCHOOL CREDITS 8 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ___7-9 _x_9-12 ___Postsecondary Adult Vocational

____ Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: COMP SVC @ 7 G ELECTRONIC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as data processing equipment repairers (85705606), or computer electronics testers (726.281-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

This program includes competencies of the common core electronics program.

The course content will include the following: installation, programming, operation, maintenance and servicing of computer systems; and diagnosis and correction of operational problems in computers arising from mechanical, electrical or electronic malfunctions.

The course content should also include training in communication, leadership, human relations and employability skills, and safe, efficient work practices.

Listed below are the courses that make up this program when offered at the secondary level.

8730210	Micro Computer Electronics 1
8730220	Micro Computer Electronics 2
8730230	Micro Computer Electronics 3
8730240	Micro Computer Electronics 4
8730250	Micro Computer Electronics 5
8730260	Micro Computer Electronics 6
8730270	Micro Computer Electronics 7
8730280	Micro Computer Electronics 8

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in industry. Students will use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Algebra is recommended as a prerequisite for entry into this program.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in direct current (DC) circuits.
03. Demonstrate proficiency in alternating current (AC) circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital circuits.
07. Demonstrate proficiency in microprocessor systems.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate proficiency in computer systems architecture.
10. Demonstrate proficiency in software fundamentals.
11. Demonstrate an understanding of communication interfacing.
12. Demonstrate an understanding of peripheral equipment.
13. Demonstrate an understanding of customer site requirements and considerations.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohmmeter (VOM) and digital volt-ohmmeter (DVM) meters and oscilloscopes.
02.09 Compute conductance and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to series circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel- series and bridge circuits.
02.18 Trouble shoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.
02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.
02.27 Set up and operate power supplies for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The

student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Set up and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and application of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.

04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.
05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.

06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and multiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze bus concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic-data analyzers for troubleshooting microprocessor systems.
07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.

08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibrations procedures.

09.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

09.01 Draw and explain systems configurations in block detail.
09.02 Interpret computer acronyms.
09.03 Identify and define priorities and interrupts at system level.
09.04 Define and list direct memory access data handling systems.
09.05 Define functions of advanced memory techniques (virtual, pipeline, cache).
09.06 Troubleshoot a microcomputer system.

10.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

10.01 Load and run operating system software.
10.02 Load and run diagnostic software.
10.03 Construct flow charts.
10.04 Analyze flow charts.
10.05 Identify and define computer languages and their uses.
10.06 Write a simple computer program in BASIC.
10.07 Write a computer program in assembly language.
10.08 Write a computer program in machine language.
10.09 Analyze firmware concepts.

11.0 DEMONSTRATE AN UNDERSTANDING OF COMMUNICATION INTERFACING--The student will be able to:

11.01 Identify and define EIA, IEEE and CCITT standards.
11.02 Identify, define and analyze sync devices.
11.03 Identify, define and analyze async devices.
11.04 Identify and define networking levels or layers.
11.05 Identify and define protocols.
11.06 Identify and define packet switching.
11.07 Identify and define multi-user systems.

12.0 DEMONSTRATE AN UNDERSTANDING OF PERIPHERAL EQUIPMENT--The student will be able to:

12.01 Identify types of cad and paper-tape equipment and interface controller.
12.02 Analyze and troubleshoot display terminals and interface controllers.
12.03 Analyze and troubleshoot printers and interface controllers.
12.04 Align printers and interface controllers.
12.05 Describe the operation of typical magnetic tape equipment and interface controllers.
12.06 Analyze disk equipment and interface controllers.
12.07 Troubleshoot and repair disk equipment and interface controllers.
12.08 Align disk equipment and interface controllers.
12.09 Define environmental requirements for peripherals and media.

13.0 DEMONSTRATE AN UNDERSTANDING OF CUSTOMER SITE REQUIREMENTS AND CONSIDERATIONS--The student will be able to:

13.01 Apply effective relations.
13.02 Follow installation procedures.
13.03 Calculate and determine power requirements.
13.04 Calculate and determine environmental requirements.
13.05 List and perform preventative maintenance techniques and

requirements.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents that may be required when applying for a job.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.

18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 1 COURSE NUMBER: 8730210

COURSE DESCRIPTION:

This course is designed to provide instruction in laboratory practices, DC circuits and technical recording and reporting.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Identify and use power tools properly.
01.05 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC).
02.02 Solve problems in electronic units utilizing metric prefixes.
02.03 Relate electricity to the nature of matter.
02.04 Identify sources of electricity.
02.05 Define voltage, current, resistance, power and energy.
02.06 Apply Ohm's law and power formulas.
02.07 Read and interpret color codes and symbols to identify electrical components and values.
02.08 Measure properties of a circuit using volt-ohmmeter (VOM) and digital volt-ohmmeter (DVM) meters and oscilloscopes.
02.09 Compute conductance and measure resistance of conductors and insulators.
02.10 Apply Ohm's law to series circuits.
02.11 Construct and verify operation of series circuits.
02.12 Analyze and troubleshoot series circuits.
02.13 Apply Ohm's law to series circuits.
02.14 Construct and verify the operation of parallel circuits.
02.15 Analyze and troubleshoot parallel circuits.
02.16 Apply Ohm's law to series-parallel and parallel-series circuits.
02.17 Construct and verify the operation of series-parallel and parallel- series and bridge circuits.
02.18 Trouble shoot series-parallel and parallel-series and bridge circuits.
02.19 Identify and define voltage divider circuits (loaded and unloaded).
02.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
02.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
02.22 Apply maximum power transfer theory.
02.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
02.24 Describe magnetic properties of circuits and devices.
02.25 Determine the physical and electrical characteristics of capacitors and inductors.

02.26 Define reactive-capacitance (R-C) and inductive-reactance (R-L) time constants and classify the output of differentiators and integrators.
02.27 Setup and operate power supplies for DC circuits.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports and make oral presentations.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters and memoranda.
08.08 Write formal reports of laboratory experiences.
08.09 Draft preventive maintenance and calibrations procedures.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics — PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 2 — COURSE NUMBER: 8730220

COURSE DESCRIPTION:

This course is designed to provide instruction in AC circuits and solid-state devices.

03.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals utilizing VOM, DVM, oscilloscope, frequency counter and function generator.
03.05 Define the characteristics of AC capacitive circuits.
03.06 Construct and verify the operation of AC capacitive circuits.
03.07 Analyze and troubleshoot AC capacitive circuits.
03.08 Define the characteristics of AC inductive circuits.
03.09 Construct and verify the operation of AC inductive circuits.
03.10 Analyze and troubleshoot AC inductive circuits.
03.11 Define and apply the principles of transformers to AC circuits.
03.12 Construct and verify the operation of AC circuits utilizing transformers.
03.13 Analyze and troubleshoot AC circuits utilizing transformers.
03.14 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.
03.15 Analyze and troubleshoot differentiator and integrator circuits.
03.16 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex).
03.17 Construct and verify the operation of RLC circuits (series, parallel and complex).
03.18 Define the characteristics of series and parallel resonant circuits.
03.19 Construct and verify the operation of series and parallel resonant

circuits.
03.20 Analyze and troubleshoot R-C, R-L and RLC circuits.
03.21 Define the characteristics of frequency selective filter circuits.
03.22 Construct and verify the operation of frequency selective filter circuits.
03.23 Analyze and troubleshoot frequency selective filter circuits.
03.24 Define the characteristics of polyphase circuits.
03.25 Define basic motor theory and operation.
03.26 Define basic generator theory and operation.
03.27 Setup and operate power supplies for AC circuits.
03.28 Analyze and measure power in AC circuits.
03.29 Set up and operate capacitor and inductor analyzers for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify and define properties of semiconductor materials.
04.02 Identify and define operating characteristics and applications of junction diodes.
04.03 Identify and define operating characteristics and application of special diodes.
04.04 Construct diode circuits.
04.05 Analyze and troubleshoot diode circuits.
04.06 Identify and define operating characteristics and applications of bipolar transistors.
04.07 Identify and define operating characteristics and applications of field effect transistors.
04.08 Identify and define operating characteristics and applications of single-stage amplifiers.
04.09 Construct single-stage amplifiers.
04.10 Analyze and troubleshoot single-stage amplifiers.
04.11 Construct thyristor circuitry.
04.12 Analyze and troubleshoot thyristor circuitry.
04.13 Set up and operate a VOM for solid-state devices.
04.14 Set up and operate a DVM for solid-state devices.
04.15 Set up and operate power supplies for solid-state devices.
04.16 Set up and operate oscilloscopes for solid-state devices.
04.17 Set up and operate function generators for solid-state devices.
04.18 Set up and operate capacitor and inductor analyzers for solid-state devices.
04.19 Set up and operate curve tracers.
04.20 Set up and operate transistor testers.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 3 COURSE NUMBER: 8730230

COURSE DESCRIPTION:

This course is designed to provide instruction in analog circuits.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operational characteristics and applications of multistage amplifiers.

05.02 Construct multistage amplifiers.
05.03 Analyze and troubleshoot multistage amplifiers.
05.04 Identify and define operating characteristics and applications of linear integrated circuits.
05.05 Identify and define operating characteristics and applications of basic power supplies and filters.
05.06 Construct basic power supplies and filters.
05.07 Troubleshoot basic power supplies and filters.
05.08 Identify and define operating characteristics and applications of differential and operational amplifiers.
05.09 Construct differential and operational amplifier circuits.
05.10 Analyze and troubleshoot differential and operational amplifier circuits.
05.11 Identify and define operating characteristics of audio power amplifiers.
05.12 Construct audio power amplifiers.
05.13 Analyze and troubleshoot audio power amplifiers.
05.14 Identify and define operating characteristics and applications of power supply regulator circuits.
05.15 Construct power supply regulator circuits.
05.16 Analyze and troubleshoot power supply regulator circuits.
05.17 Identify and define operating characteristics and applications of active filters.
05.18 Construct active filter circuits.
05.19 Analyze and troubleshoot active filter circuits.
05.20 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
05.21 Construct oscillator circuits.
05.22 Analyze and troubleshoot oscillator circuits.
05.23 Identify and define operating characteristics and applications of motor phase-shift control circuits (single-phase and multiphase).
05.24 Identify and define operating characteristics and applications of cathode ray tubes.
05.25 Identify and define operating characteristics and applications of optoelectronic devices.
05.26 Set up and operate measuring instruments for analog circuits.

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STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Micro Computer Electronics	PROGRAM NUMBER: 8730200
PROGRAM TITLE: Micro Computer Electronics 4	COURSE NUMBER: 8730240

COURSE DESCRIPTION:

This course is designed to provide instruction in digital devices.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

06.01 Define and apply numbering systems to codes and arithmetic operations.
06.02 Analyze and minimize logic circuits using Boolean operations.
06.03 Set up and operate logic probes for digital circuits.
06.04 Set up and operate power supplies for digital circuits and solve power distribution and noise problems.
06.05 Set up and operate pulsers for digital circuits.
06.06 Set up and operate oscilloscopes for digital circuits.

06.07 Set up and operate logic analyzers for digital circuits.
06.08 Set up and operate pulse generators for digital circuits.
06.09 Identify types of logic gates and their truth tables.
06.10 Construct combinational logic circuits using integrated circuits.
06.11 Troubleshoot logic circuits.
06.12 Analyze types of flip-flops and their truth tables.
06.13 Construct flip-flops using integrated circuits.
06.14 Troubleshoot flip-flops.
06.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
06.16 Identify types of registers and counters.
06.17 Construct registers and counters using flip-flops and logic gates.
06.18 Troubleshoot registers and counters.
06.19 Analyze clock and timing circuits.
06.20 Construct clock and timing circuits.
06.21 Troubleshoot clock and timing circuits.
06.22 Identify types of arithmetic-logic circuits.
06.23 Construct arithmetic-logic circuits.
06.24 Troubleshoot arithmetic-logic circuits.
06.25 Identify types of encoding and decoding devices.
06.26 Construct encoders and decoders.
06.27 Troubleshoot encoders and decoders.
06.28 Identify types of multiplexer and demultiplexer circuits.
06.29 Construct multiplexer and multiplexer circuits using integrated circuits.
06.30 Troubleshoot multiplexer and demultiplexer circuits.
06.31 Identify types of memory circuits.
06.32 Relate the uses of digital-to-analog and analog-to-digital conversions.
06.33 Construct digital-to-analog and analog-to-digital circuits.
06.34 Troubleshoot digital-to-analog and analog-to-digital circuits.
06.35 Identify types of digital displays.
06.36 Construct digital display circuits.
06.37 Troubleshoot digital display circuits.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 5 COURSE NUMBER: 8730250

COURSE DESCRIPTION:

This course is designed to provide instruction in microprocessing and system architecture.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSOR SYSTEMS--The student will be able to:

07.01 Identify central processing unit (CPU) building blocks and their uses (architecture).
07.02 Analyze bus concepts.
07.03 Analyze various memory schemes.
07.04 Use memory devices in circuits.
07.05 Troubleshoot memory device circuits.
07.06 Set up and operate oscilloscopes for microprocessor systems.
07.07 Set up and operate logic-data analyzers for troubleshooting microprocessor systems.

07.08 Identify types of input and output devices and peripherals.
07.09 Interface input and output ports to peripherals.
07.10 Analyze and troubleshoot input and output ports.
07.11 Execute computer instruction sets.

09.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

09.01 Draw and explain systems configurations in block detail.
09.02 Interpret computer acronyms.
09.03 Identify and define priorities and interrupts at system level.
09.04 Define and list direct memory access data handling systems.
09.05 Define functions of advanced memory techniques (virtual, pipeline, cache).
09.06 Troubleshoot a microcomputer system.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics — PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 6 — COURSE NUMBER: 8730260

COURSE DESCRIPTION:

This course is designed to provide instruction in software fundamentals and communication interfacing.

10.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

10.01 Load and run operating system software.
10.02 Load and run diagnostic software.
10.03 Construct flow charts.
10.04 Analyze flow charts.
10.05 Identify and define computer languages and their uses.
10.06 Write a simple computer program in BASIC.
10.07 Write a computer program in assembly language.
10.08 Write a computer program in machine language.
10.09 Analyze firmware concepts.

11.0 DEMONSTRATE AN UNDERSTANDING OF COMMUNICATION INTERFACING--The student will be able to:

11.01 Identify and define EIA, IEEE and CCITT standards.
11.02 Identify, define and analyze sync devices.
11.03 Identify, define and analyze async devices.
11.04 Identify and define networking levels or layers.
11.05 Identify and define protocols.
11.06 Identify and define packet switching.
11.07 Identify and define multi-user systems.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics — PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 7 COURSE NUMBER: 8730270

COURSE DESCRIPTION:

This course is designed to provide instruction in peripheral equipment and customer site requirements.

12.0 DEMONSTRATE AN UNDERSTANDING OF PERIPHERAL EQUIPMENT--The student will be able to:

12.01 Identify types of cad and paper-tape equipment and interface controller.
12.02 Analyze and troubleshoot display terminals and interface controllers.
12.03 Analyze and troubleshoot printers and interface controllers.
12.04 Align printers and interface controllers.
12.05 Describe the operation of typical magnetic tape equipment and interface controllers.
12.06 Analyze disk equipment and interface controllers.
12.07 Troubleshoot and repair disk equipment and interface controllers.
12.08 Align disk equipment and interface controllers.
12.09 Define environmental requirements for peripherals and media.

13.0 DEMONSTRATE AN UNDERSTANDING OF CUSTOMER SITE REQUIREMENTS AND CONSIDERATIONS--The student will be able to:

13.01 Apply effective relations.
13.02 Follow installation procedures.
13.03 Calculate and determine power requirements.
13.04 Calculate and determine environmental requirements.
13.05 List and perform preventative maintenance techniques and requirements.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

PROGRAM TITLE: Micro Computer Electronics 8 COURSE NUMBER: 8730280

COURSE DESCRIPTION:

This course is designed to provide instruction in employability skills and entrepreneurship.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents that may be required when applying for a job.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK | PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION | EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Microelectronics Manufacturing Process Technology

CODE NUMBER: Secondary ________ Postsecondary I150499

Florida CIP 0615.049902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS __X__

APPLICABLE LEVEL(S): _____7-9 _____9-12 __X__PostSecondary Adult Vocational

_____Postsecondary Vocational __X__Other ___30, 31___

CERTIFICATION COVERAGE: Electronics @7G Tec Elec @7G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as Microelectronic Manufacturing Process Technologists. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program includes selected competencies from the common core electronics program.

The content includes, but is not limited to the following: statistical process control, direct current (DC) circuits, alternating current (AC) circuits, analog, solid-state and digital devices, use of circuit diagrams and schematics, high reliability soldering, laboratory practices; clean room contamination control, computer literacy, human relations, employability skills, work safety practices and ethics.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test equipment, materials and processes found in the semiconductor manufacturing industry. Students will troubleshoot, reassemble and calibrate precision equipment used in the microelectronic manufacturing process.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level entry requirement for this postsecondary adult vocational program is: Mathematics 10.0, Language 10.0, and Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successful completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in oral and written communications.
03. Demonstrate proficiency in mathematics functions.
04. Demonstrate proficiency in the application of chemistry and physics to the manufacturing.
05. Demonstrate proficiency in DC circuits.
06. Demonstrate proficiency in AC circuits.
07. Demonstrate proficiency in solid-state devices.
08. Demonstrate proficiency in analog circuits.
09. Demonstrate proficiency in digital circuits.
10. Demonstrate proficiency in the use of computers.
11. Demonstrate proficiency in general and environmental health and safety procedures.
12. Demonstrate an proficiency in cleanroom contamination control.
13. Demonstrate proficiency in concepts of Statistical Process Control.
14. Demonstrate proficiency in non-destructive testing.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ____
PROGRAM TITLE: Microelectronics Manufacturing Process Technology
POSTSECONDARY NUMBER: I150499

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The Student will be able to:

01.01 Apply proper OSHA safety standards.
01.02 Make electrical connections.
01.03 Identify and use hand tools properly.
01.04 Demonstrate acceptable soldering and desoldering techniques.

02.0 DEMONSTRATE PROFICIENCY IN ORAL AND WRITTEN COMMUNICATIONS--The Student will be able to:

02.01 Identify methods to improve reading techniques.
02.02 Describe the methods to improve memory.
02.03 Describe effective listening styles.
02.04 Demonstrate the note taking process.
02.05 Identify techniques in effective test taking.
02.06 Prepare a variety of written industrial communications.
02.07 Prepare and present individual and group oral presentations.

03.0 DEMONSTRATE PROFICIENCY IN MATHEMATICS FUNCTIONS--The Student will be able to:

03.01 Solve problems using the manipulation of numbers, fractions, decimals, percents, integers, and exponents.
03.02 Solve problems requiring the use of scientific notation.
03.03 Solve problems requiring the use of algebraic expressions.
03.04 Solve problems requiring the use of graphing relations and functions.
03.05 Solve problems requiring the use of geometric and trigonometric functions.
03.06 Apply mathematic functions to the manufacturing process.

04.0 DEMONSTRATE PROFICIENCY IN THE APPLICATION OF CHEMISTRY AND PHYSICS TO THE MANUFACTURING PROCESS --The Student will be able to:

04.01 Identify chemical elements from their symbols and their placement in the periodic table.
04.02 Describe the basic atomic structure of specific elements.
04.03 Describe the three basic states of matter.
04.04 Identify the basic properties of acids, bases and salts.
04.05 Identify the characteristics of ionic and covalent bonds.
04.06 Describe the effects of the three basic laws of thermodynamics on the manufacturing of electronics components.
04.07 Describe electrochemistry processes used in industrial processes such as electroplating.
04.08 Describe and measure force in mechanical, fluid, electrical and thermal systems.
04.09 Describe how work in mechanical, fluid and electrical systems involves the presence of force and movement.
04.10 Identify and measure rate in mechanical, fluid, electrical and thermal systems.
04.11 Identify and measure resistance in mechanical, fluid, electrical and thermal systems.
04.12 Identify and measure energy in mechanical, fluid, electrical and thermal systems.

04.13 Identify force transformers in linear mechanical, rotational mechanical, fluid and electrical systems.
04.14 Identify wave and vibration theory.
04.15 Describe light and optical systems in the manufacturing workplace.

05.0 DEMONSTRATE PROFICIENCY IN DIRECT CURRENT (DC) CIRCUITS--The student will be able to:

05.01 Solve algebraic problems to include exponentials (prerequisite to DC).
05.02 Solve problems in electronics units utilizing metric prefixes.
05.03 Relate electricity to the nature of matter.
05.04 Identify sources of electricity.
05.05 Define voltage, current, resistance, power and energy.
05.06 Apply Ohm's law and power formulas.
05.07 Read and interpret color codes and symbols to identify electrical components and values.
05.08 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
05.09 Compute conductance and compute and measure resistance of conductors and insulators.
05.10 Apply Ohm's law to series circuits.
05.11 Construct and verify operation of series circuits.
05.12 Analyze and troubleshoot series circuits.
05.13 Apply Ohm's law to parallel circuits.
05.14 Construct and verify the operation of parallel circuits.
05.15 Analyze and troubleshoot parallel circuits.
05.16 Apply Ohm's law to series-parallel and parallel-series circuits.
05.17 Construct and verify the operation of series-parallel and parallel-series and bridge circuits.
05.18 Troubleshoot series-parallel and parallel-series and bridge circuits.
05.19 Identify and define voltage divider circuits (loaded and unloaded).
05.20 Construct and verify the operation of voltage divider circuits (loaded and unloaded).
05.21 Analyze and troubleshoot voltage divider circuits (loaded and unloaded).
05.22 Apply maximum power transfer theory.
05.23 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory.
05.24 Describe magnetic properties of circuits and devices.
05.25 Determine the physical and electrical characteristics of capacitors and inductors.
05.26 Describe reactive-capacitance (R-C) and inductive reactance(R-L) time constants and classify the output of differentiators and integrators.
05.27 Setup and operate power supplies for DC circuits.

06.0 DEMONSTRATE PROFICIENCY IN ALTERNATING CURRENT (AC) CIRCUITS-- The student will be able to:

06.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC).
06.02 Identify properties of an AC signal.
06.03 Identify AC sources.
06.04 Analyze and measure AC signals utilizing DVM and oscilloscope.
06.05 Define the characteristics of AC capacitive circuits.
06.06 Construct and verify the operation of AC capacitive circuits.
06.07 Analyze and troubleshoot AC capacitive circuits.
06.08 Define the characteristics of AC inductive circuits.

06.09 Construct and verify the operation of AC inductive circuits.
06.10 Analyze and troubleshoot AC inductive circuits.
06.11 Define and apply the principles of transformers and AC circuits.
06.12 Construct and verify the operation of AC circuits utilizing transformers.
06.13 Analyze and troubleshoot AC circuits utilizing transformers.
06.14 Analyze and troubleshoot differentiator and integrator circuits.
06.15 Define the characteristics of resistance inductance capacitance (RLC) circuits (series, parallel and complex)
06.16 Define the characteristics of series and parallel resonant circuits.
06.17 Define the characteristics of frequency selective filter circuits.
06.18 Construct and verify the operation of frequency selective filter circuits.
06.19 Define basic motor theory and operation.
06.20 Define basic generator theory and operation.

07.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

07.01 Identify and define properties of semiconductor materials.
07.02 Identify and define operating characteristics and applications of junction diodes.
07.03 Identify and define operating characteristics and applications of special diodes.
07.04 Construct diode circuits.
07.05 Analyze and troubleshoot diode circuits.
07.06 Identify and define operating characteristics and application of bipolar transistors.
07.07 Identify and define operating characteristics and applications of field effect transistors.
07.08 Identify and define operating characteristics and applications of single-stage amplifiers.
07.09 Construct single-stage amplifiers.
07.10 Analyze and troubleshoot single-stage amplifiers.
07.11 Setup and operate a DVM for solid-state devices.
07.12 Setup and operate power supplies for solid-state devices.
07.13 Setup and operate oscilloscopes for solid-state devices.
07.14 Setup and operate function generators for solid-state devices.

08.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

08.01 Identify and define operating characteristics and applications of linear integrated circuits.
08.02 Identify and define operating characteristics and applications of basic power supplies and filters.
08.03 Construct basic power supplies and filters.
08.04 Identify and define operating characteristics and applications of differential and operational amplifiers.
08.05 Construct differential and operational amplifier circuits.
08.06 Identify and define operating characteristics of audio power amplifiers.
08.07 Construct audio power amplifiers.
08.08 Analyze and troubleshoot audio power amplifiers.
08.09 Identify and define operating characteristics and applications of power supply regulator circuits.
08.10 Construct power supply regulator circuits.
08.11 Identify and define operating characteristics and applications of active filters.
08.12 Construct active filter circuits.

08.13 Identify and define operating characteristics and applications of sinusoidal and nonsinusoidal oscillator circuits.
08.14 Construct oscillator circuits.

09.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS--The student will be able to:

09.01 Define and apply numbering systems to codes and arithmetic operations.
09.02 Analyze and minimize logic circuits using Boolean operations.
09.03 Setup and operate oscilloscopes for digital circuits.
09.04 Setup and operate pulse generators for digital circuits.
09.05 Identify types of logic gates and their truth tables.
09.06 Construct combinational logic circuits using integrated circuits.
09.07 Troubleshoot logic circuits.
09.08 Analyze types of flip-flops and their truth tables.
09.09 Construct flip-flops using integrated circuits.
09.10 Troubleshoot flip-flops.
09.11 Identify, define and measure characteristics of integrated circuits (IC) logic families.
09.12 Identify types of registers and counters.
09.13 Construct registers and counters using flip-flops and logic gates.
09.14 Analyze clock and timing circuits.
09.15 Construct clock and timing circuits.
09.16 Identify types of digital displays.

10.0 DEMONSTRATE PROFICIENCY IN USE OF COMPUTERS--The student will be able to:

10.01 Use the personal computer disk operating system.
10.02 Use word processor applications programs.
10.03 Use spreadsheet applications programs.
10.04 Use electronic mail applications programs.

11.0 DEMONSTRATE PROFICIENCY IN IDENTIFICATION OF GENERAL AND ENVIRONMENTAL HEALTH AND SAFETY PROCEDURES--The student will be able to:

11.01 Identify household hazards.
11.02 Identify and report electrical hazards.
11.03 Identify and report chemical hazards.
11.04 Identify and report environmental hazards.
11.05 Describe chemical handling procedures.
11.06 Describe fire safety procedures.
11.07 Identify laser safety procedures.
11.08 Administer CPR.

12.0 DEMONSTRATE PROFICIENCY IN CLEANROOM CONTAMINATION CONTROL--The student will be able to:

12.01 Identify cleanroom classification standards.
12.02 Identify cleanroom garment procedures.
12.03 Identify pure water techniques.
12.04 Identify electro static control procedures.
12.05 Identify pure chemical techniques.
12.06 Identify surface particle detection procedures.
12.07 Identify wafer automation and transfer systems.

13.0 DEMONSTRATE PROFICIENCY IN STATISTICAL PROCESS CONTROL--The student will be able to:

13.01 Define statistics and statistical process control.
13.02 Apply the terms of statistical process control to the collection, manipulation, and display of meaningful data.
13.03 Calculate probabilities, given specific sets of data, and given an range of data.
13.04 Assimilate data, define its purpose, identify an appropriate display device (histogram, stem and leaf, running charts, pareto charts, fishbone diagram) and interpret its meaning.
13.05 Define, identify, construct, calculate, interpret control charts.

14.0 DEMONSTRATE PROFICIENCY IN NON-DESTRUCTIVE TESTING.--The student will be able to:

14.01 Describe pressure and leak testing procedures.
14.02 Describe the procedures for liquid penetration inspection.
14.03 Describe the procedures for thermal testing.
14.04 Describe X-ray radiography theory.
14.05 Describe ultrasonics testing procedures.
14.06 Describe dynamic testing procedures.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The Student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when apply for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employee.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The Student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Mine Safety and Health

CODE NUMBER: Secondary ____ Postsecondary 1150799

Florida CIP 0615.079901

SECONDARY SCHOOL CREDITS__ COLLEGE CREDITS__ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): __7-9 __9-12 _x_Postsecondary Adult Vocational

__Postsecondary Vocational __Other 30,31

CERTIFICATION COVERAGE: MSHA @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students to meet safety and health requirements for employment as miners working at surface mines and surface areas of underground mines as required by the Federal Mine Safety and Health Act of 1977 (Public Law 91-173 as amended by Public Law 95-164) or to provide updating and refresher training for persons previously or currently employed in these occupations as required by the Act.

The content includes, but is not limited to instruction in the statutory rights of miners, self-rescue and respiratory devices, mine conveyances and communications systems, introduction to the work environment, mandatory health and safety standards, escape and emergency evacuation plans, ground control, first aid, hazard recognition, and accident prevention.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and should include activities in the use, care, and maintenance of self-rescue and respiratory devices (where applicable); use of mine tour; fire warning signals and fire fighting procedures; hazard recognition; first aid methods and accident prevention procedures.

III. SPECIAL NOTE: The instruction in this program must be provided by instructors who, under Title 30 Code of Federal Regulations, Part 48, Subpart B, are Mine Safety and Health Administration (MSHA) approved instructors. The instructional content must be in accordance with the provisions of Public Law 91-173 as amended by Public Law 95-174; 30 CFR, Part 48, Subpart B; and training outlines provided by the Mine Safety and Health Administration.

Students required to receive mine safety and health training prior to employment at surface mines and surface areas of underground mines are classified as "miners" as defined in 30 CFR, Part 48, Subpart B, Section 48.22.

The length of this program, in accordance with the provisions of Public Law 91-173 as amended by Public Law 95-164 and 30 CFR, Part 48, Subpart B, will be a minimum of 24 hours for new miners and 8 hours of annual refresher training for all miners.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform employment obligations in accordance with the statutory rights of miners as defined in the Federal Mine Safety and Health Act of 1977 (Act) and Title 30 Code of Federal Regulations (30 CFR).
02. Use self-rescue and respiratory devices applicable to the employment.
03. Use the mine system of conveyances for miners and materials with safety and use the mine communication system for safety purposes.
04. Demonstrate knowledge of the working environment.
05. Use escape and emergency evacuation routes, recognize fire warning signals, and perform firefighting procedures.
06. Work safely in areas of highwalls, water hazards, pits and spoil banks and practice safe work procedures during hours of darkness.
07. Demonstrate a knowledge of requirements for dust, noise and other health measurements.
08. Recognize and avoid generally hazardous conditions.
09. Recognize and avoid electrical hazards.
10. Recognize and avoid hazards related to explosives.
11. Observe health and safety aspects for assigned tasks.
12. Perform first aid measures.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER:

PROGRAM TITLE: Mine Safety and Health
POSTSECONDARY NUMBER: I150799

01.0 PERFORM EMPLOYMENT OBLIGATIONS IN ACCORDANCE WITH THE STATUTORY RIGHTS OF MINERS AS DEFINED IN THE FEDERAL MINE SAFETY AND HEALTH ACT OF 1977 (ACT) AND TITLE 30 CODE OF FEDERAL REGULATIONS (30 CFR)--The student will be able to:

01.01 State the purpose of the Act and 30 CFR Part 48.
01.02 Summarize the rights of miners with respect to safeguarding miner safety and health.
01.03 Outline and authority and responsibility of the supervisor pertaining to safety and health practices.
01.04 Report accidents and hazards through proper channels.

02.0 USE SELF-RESCUE AND RESPIRATORY DEVICES APPLICABLE TO THE EMPLOYMENT--The student will be able to:

02.01 Identify self-rescue devices appropriate to the situation.
02.02 Use self-rescue devices effectively.
02.03 Identify conditions warranting use of respiratory devices.
02.04 Identify the appropriate type of respiratory device for use under specific conditions.
02.05 Use the various types of respiratory devices properly and effectively.

03.0 USE MINE CONVEYANCE SYSTEMS SAFELY AND THE MINE COMMUNICATIONS SYSTEM FOR SAFETY PURPOSES--The student will be able to:

03.01 Apply company, state, and federal rules with respect to the safe use of conveyance systems to transport personnel and materials.
03.02 Use the telephone system, warning system, and two-way radio as applicable to the employment situation.
03.03 Recognize and avoid the specific hazards of the work area as they pertain to haul roads, haulage equipment, pit area, blasting area, and plant area.
03.04 Recognize and observe both normal signs and emergency signs as appropriate.

04.0 DEMONSTRATE KNOWLEDGE OF THE WORKING ENVIRONMENT--The student will be able to:

04.01 Identify the principal product, secondary product, and by-products produced by the employing company.
04.02 Identify the mining method used (i.e., single bench, multiple bench, dredging).
04.03 Identify the mining machinery used for drilling, excavating, and haulage and explain its general function and interrelationship with other mine functions.
04.04 Identify milling methods and machinery for crushing, sizing, separation of the mining products, and explain their general function and interrelationship with other mine functions.
04.05 Identify the methods of conveyance such as belt conveyors, screw conveyors, slurry, air, vehicle, rail, water conveyances and explain their general function and interrelationship with other mine functions.
04.06 Identify the hazardous areas, communications equipment, first aid supplies, firefighting equipment, and warning signs and devices of

the work area.

05.0 USE ESCAPE AND EMERGENCY EVACUATION ROUTES, RECOGNIZE FIRE WARNING SIGNALS, AND PERFORM FIREFIGHTING PROCEDURES--The student will be able to:

05.01 Follow appropriate escape and emergency evacuation routes of the mine and/or plant.
05.02 Activate an emergency alarm system.
05.03 Recognize and/or activate the firewarning signal.
05.04 Select and use the appropriate type of fire extinguisher for specific types of fires.

06.0 WORK SAFELY IN AREAS OF HIGHWALLS, WATER HAZARDS, PITS AND SPOIL BANKS AND PRACTICE SAFE WORK PROCEDURES DURING HOURS OF DARKNESS--The student will be able to:

06.01 Recognize dangers in a highwall area and make needed corrections.
06.02 Recognize water hazards and take adequate precautions.
06.03 Recognize dangers in pit and spoil bank areas and make needed corrections.
06.04 Provide adequate illumination and practice safe work procedures during hours of darkness.

07.0 DEMONSTRATE A KNOWLEDGE OF REQUIREMENTS FOR DUST, NOISE, AND OTHER HEALTH MEASUREMENTS--The student will be able to:

07.01 Recognize common surface mine health hazards, including dust, noise, gases and fumes, and caustic, acid, and toxic chemicals.
07.02 Recognize conditions approaching the danger level and identify a need for sampling and measurement.
07.03 Take measures to protect self from injury.

08.0 RECOGNIZE AND AVOID GENERALLY HAZARDOUS CONDITIONS--The student will be able to:

08.01 Define hazards and accidents and recognize their causes.
08.02 Identify the hazards associated with each task pertaining to a particular job.
08.03 Make changes in the working environment, determine appropriate safety procedures, and select and use appropriate apparel and equipment to avoid or reduce the hazard.

09.0 RECOGNIZE AND AVOID ELECTRICAL HAZARDS--The student will be able to:

09.01 Recognize the effect of the human body coming in contact with electrical power.
09.02 Identify potential electrical hazards in the mine environment.
09.03 Rescue a worker from an electrical power source.

10.0 RECOGNIZE AND AVOID HAZARDS RELATED TO EXPLOSIVES--The student will be able to:

10.01 Demonstrate a knowledge of permissible explosives for use at surface mines.
10.02 Demonstrate a knowledge of the types of hazards associated with explosives and their sources and take appropriate precautions.

11.0 OBSERVE HEALTH AND SAFETY ASPECTS FOR ASSIGNED TASKS--The student will be able to:

11.01 Analyze the health and safety aspects of assigned task.

11.02 Perform the assigned task correctly, avoiding careless or thoughtless practices that will endanger health and safety.

12.0 PERFORM FIRST AID MEASURES--The student will be able to:

12.01 Perform artificial respiration.
12.02 Control bleeding.
12.03 Treat individuals for physical shock.
12.04 Provide initial treatment for wounds and burns.
12.05 Provide initial treatment for fractures and dislocations.
12.06 Transport an injured individual without compounding the injury.
12.07 Determine type of poisoning (ingestion, absorption, inhalation) and provide appropriate initial treatment.
12.08 Take initial action to treat victims of heart attack, stroke, heat exhaustion, or epileptic convulsions.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate job competence in job interview techniques.

16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to.

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.
17.07 Identify basic occupational licensing and insurance.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Motorcycle Mechanics

CODE NUMBER: Secondary ______ Postsecondary 1470616

Florida CIP 0647.060601

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_ Postsecondary Adult Vocational

______ Postsecondary Vocational _x_ Other 30,31

CERTIFICATION COVERAGE: MOTORCYCLE @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as motorcycle repairers (85308636), or motorcycle technicians (620.281-054), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintaining, troubleshooting, and repairing motorcycle engines and components.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in maintenance of frames and suspension, maintenance of wheels and brakes, maintenance of drive train, and maintenance and repair of engines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Service, repair, troubleshoot/diagnose and overhaul frames and suspension.
02. Service, repair, troubleshoot/diagnose and overhaul wheels and brakes.
03. Service, repair, troubleshoot/diagnose and overhaul drive trains.
04. Service, repair, troubleshoot/diagnose and overhaul fuel and exhaust systems.
05. Service, repair, troubleshoot/diagnose and overhaul electrical systems.
06. Tune-up motorcycles.
07. Service, repair, troubleshoot/diagnose and overhaul engines.
08. Perform related mechanical skills.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Motorcycle Mechanics POSTSECONDARY NUMBER: I470616

01.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL FRAMES AND SUSPENSION--The student will be able to:

01.01 Service and overhaul front suspension.
01.02 Straighten fork tubes and triple clamps.
01.03 Service and overhaul rear suspension.
01.04 Remove and replace frames.

02.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL WHEELS AND BRAKES--The student will be able to:

02.01 Remove and replace hub.
02.02 Remove and remount tires.
02.03 Overhaul drum brakes.
02.04 Overhaul hydraulic brakes.

03.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL DRIVE TRAINS--The student will be able to:

03.01 Replace chain and sprocket.
03.02 Overhaul primary drive.
03.03 Overhaul transmission.
03.04 Overhaul shaft drive.
03.05 Service kickstart systems.

04.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL FUEL AND EXHAUST SYSTEMS--The student will be able to:

04.01 Identify components and operation of carburetors.
04.02 Diagnose and repair slide type carburetors.
04.03 Diagnose and repair CV type carburetors.
04.04 Diagnose and repair fixed venturi carburetors.
04.05 Diagnose and repair exhaust system.
04.06 Troubleshoot and repair fuel delivery systems.

05.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL ELECTRICAL SYSTEMS--The student will be able to:

05.01 Apply electrical theory.
05.02 Utilize electrical test equipment.
05.03 Read wiring diagram.
05.04 Troubleshoot and repair wire system.
05.05 Troubleshoot and repair battery ignition system.
05.06 Troubleshoot and repair magneto and CDI ignition systems.
05.07 Troubleshoot and repair half-wave and full-wave charging systems.
05.08 Troubleshoot and repair 3-phase charging system.
05.09 Troubleshoot and repair electrical starter system.
05.10 Troubleshoot and repair D.C. generators.

06.0 TUNE-UP MOTORCYCLES--The student will be able to:

06.01 Diagnose performance problems.
06.02 Adjust valve clearance and cam chain.
06.03 Replace ignition points and timing.
06.04 Adjust carburetor and service fuel delivery systems.

06.05 Tune-up two stroke motorcycles.
06.06 Tune-up single cylinder motorcycles (four-stroke).
06.07 Tune-up multi-cylinder motorcycles (four-stroke).
06.08 Service air filters.
06.09 Service and diagnose storage battery.
06.10 Service lubrication system

07.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL ENGINES--The student will be able to:

07.01 Apply engine operating theory.
07.02 Overhaul single cylinder 4-stroke top-end.
07.03 Overhaul multi-cylinder 4-stroke top-end.
07.04 Overhaul two stroke top-end.
07.05 Rebuild 4-stroke head.
07.06 Perform complete overhaul on single cylinder 4-stroke engines.
07.07 Perform complete overhaul on multi-cylinder 4-stroke engine.
07.08 Perform complete overhaul on two stroke engine.
07.09 Rebuild built-up crankshaft.
07.10 Service plain bearing crankshaft.
07.11 Service and repair water cooling systems.

08.0 PERFORM RELATED MECHANICAL SKILLS--The student will be able to:

08.01 Utilize oxyacetylene welding outfit for heating, welding, brazing and cutting.
08.02 Utilize propane torch for miscellaneous operations.
08.03 Perform specialized welding operations.
08.04 Rebore cylinder.
08.05 Perform basic metal lathe operations.
08.06 Demonstrate understanding of safety rules.
08.07 Demonstrate understanding of shop and class procedures.
08.08 Identify hand tools.
08.09 Utilize measuring tools.
08.10 Utilize and maintain basic shop equipment.
08.11 Identify and use standard fasteners.
08.12 Identify gaskets and choose sealants.
08.13 Use parts and service manuals.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a

materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make appropriate job changes.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Multi-Media Technology

CODE NUMBER: Secondary ______ Postsecondary ______

Florida CIP 0610.010202

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

__x__ Postsecondary Vocational ______ Other ______________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as multi-media managers, communications systems managers, or audio visual production managers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, the learning of management skills permitting the graduate to oversee the operation of institutional and industrial multi-media operations. Instruction includes: production analysis, the design and production of multi-media graphics, the photographic creative process, television programming and production techniques, multi-media management and the application of production skills to solving the problems relating to the integration of multi-media. Also included are skills relating to professionalism, employability, communication, and management.

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program with emphasis on the synthesis of disparate multi-media components into a unified presentation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The graduating student may enroll in a Multi-Media Practicum prior to the completion of the program. The Practicum content will include resume' skills, a presentation portfolio, and the assessment of interview skills and techniques.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal.

The typical length of this program for the average achieving student is an associate degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Differentiate between various mass communication theories.
02. Analyze the history, controls, ethics and responsibilities of the mass media.
03. Maintain multi-media equipment to industry standards.
04. Create projects and presentations utilizing a variety of multi-media technologies.
05. Demonstrate basic competency with still photography equipment.
06. Design and execute the photographic creative process to enhance multi-media presentations.
07. Design and create materials for multi-media presentations.
08. Generate applications of video technology as applied to multi-media presentations.
09. Generate applications of audio technology as applied to multi-media presentations.
10. Evaluate computer application for multi-media presentation needs.
11. Produce multi-image and multi-media programs.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Multi-Media Technology POSTSECONDARY NUMBER:

01.0 DIFFERENTIATE BETWEEN VARIOUS MASS COMMUNICATION THEORIES--The student will be able to:

01.01 Contrast the various communication media.
01.02 Assess the future potential of each mass media.
01.03 Formulate a model of communications.
01.04 Interpret symbol usage.
01.05 Identify and analyze the major characteristics of large, small and individual multi-media presentations.

02.0 ANALYZE THE HISTORY, CONTROLS, ETHICS, AND RESPONSIBILITIES OF THE MASS MEDIA--The student will be able to:

02.01 Describe the history of mass media.
02.02 Discuss the rights, responsibilities and controls of various media.
02.03 Evaluate the impact of various media on society.
02.04 Interpret ethics and discuss recent litigation involving multi-media.

03.0 MAINTAIN MULTI-MEDIA EQUIPMENT TO INDUSTRY STANDARDS--The student will be able to:

03.01 Demonstrate the proper care and handling of equipment used in multi-media.
03.02 Perform pre and post production routines for proper presentations.
03.03 Analyze equipment performance to meet industry standards.

04.0 CREATE PROJECTS AND PRESENTATIONS UTILIZING A VARIETY OF MULTI-MEDIA TECHNOLOGIES--The student will be able to:

04.01 Analyze the strengths and weaknesses of presentational media.
04.02 Appraise production resources to achieve desired outcomes.
04.03 Utilize production techniques to create the desired outcomes.
04.04 Adapt learned skills and generate new approaches in order to solve unique production problems.

05.0 DEMONSTRATE BASIC COMPETENCY WITH STILL PHOTOGRAPHY EQUIPMENT--The student will be able to:

05.01 Understand the correlation between ISO speed and emulsions of photographic film.
05.02 Interpret the relationship between f/stop and shutter speeds.
05.03 Define the photographic principles of Depth-of-Field.
05.04 Define the photographic principles of Fields-of-View and its relationship to focal length.
05.05 Distinguish the properties of various still camera formats such as 2 1/4 x 2 1/4 and 4 x 5.
05.06 Understand the properties of light and how to measure its intensity and color.

06.0 DESIGN AND EXECUTE THE PHOTOGRAPHIC CREATIVE PROCESS TO ENHANCE MULTI-MEDIA PRESENTATION--The student will be able to:

06.01 Translate the rules of art composition into still photography.
06.02 Apply the "elements of design" to the photographic print making

process.

06.03 Create photographic products using accepted photographic darkroom techniques.

06.04 Integrate the use of photographic special effects into multi-media presentations.

06.05 Appraise photographic quality by accepted industry standards.

07.0 DESIGN AND CREATE MATERIALS FOR MULTI-MEDIA PRESENTATIONS--The student will be able to:

07.01 Develop communication skills to assess and evaluate presentation goals.

07.02 Evaluate multi-media resources to achieve desired outcomes.

07.03 Demonstrate a proficiency in computer generated graphics for multi-media.

07.04 Synthesize available multi-media technologies into a unified presentation(s).

08.0 GENERATE APPLICATIONS OF VIDEO TECHNOLOGY AS APPLIED TO MULTI-MEDIA PRESENTATIONS--The student will be able to:

08.01 Understand basic TV camera operation including Universal Focus and Depth-of-Field.

08.02 Organize and execute video tape recording and editing.

08.03 Demonstrate proficiency in assemble and insert editing techniques.

08.04 Perform television production and programming activities.

08.05 Formulate and organize a plan for video field production.

08.06 Design, understand and implement an audio system for video production.

08.07 Design understand and implement a lighting plot for video production.

08.08 Operate the components of a tele-conference system.

09.0 GENERATE APPLICATIONS OF AUDIO TECHNOLOGY AS APPLIED TO MULTI-MEDIA PRESENTATIONS--The student will be able to:

09.01 Evaluate production needs for microphone applications.

09.02 Demonstrate proficiency with a multi-channel audio mixer.

09.03 Generate strategies for physical and electronic audio tape editing.

09.04 Generate strategies for multi-track recordings to industry standards.

09.05 Interpreting the applications of copyright laws as they apply to prerecorded materials.

10.0 EVALUATE COMPUTER APPLICATION FOR MULTI-MEDIA PRESENTATION NEEDS--The student will be able to:

10.01 Demonstrate a basic proficiency with word processing software packages.

10.02 Design and produce a computer generated graphic.

10.03 Design and produce a computer generated desktop publication.

11.0 PRODUCE MULTI-IMAGE AND MULTI-MEDIA PROGRAMS--The student will be able to:

11.01 Assess needs of the end user.

11.02 Analyze resources available.

11.03 Create and write a script appropriate to the media selected.

11.04 Create and prepare a storyboard appropriate to the media selected.

11.05 Organize resources and manage personnel selected to implement production.

11.06 Appraise the quality and end user application of finished presentation.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Create and write a resume'.
15.02 Prepare and compile a work portfolio.
15.03 Identify acceptable work habits.
15.04 Demonstrate competence in job interview techniques.
15.05 Formulate strategy for post graduation.
15.06 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful

entrepreneur.

16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Music Production Technology

CODE NUMBER: Secondary ______ Postsecondary _______

Florida CIP 0650.099900

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS X POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): _____6-9 _____9-12 _____Postsecondary Adult Vocational

X Postsecondary Vocational _____ Other______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment in music production occupations or to provide supplemental professional training for persons previously or currently employed in this field.

The content includes, but is not limited to instruction that prepares individuals for positions such as music directors, singers, composers, and related workers (34047183).

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program and include the use of multi-track recording systems, computers which will interface with these systems, audio reinforcement systems, sound mixing devices and peripheral equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be used for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan signed by the student, the instructor and the employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the student's career goal. Students must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Write, analyze, hear and interpret rhythmic, melodic and harmonic patterns in a variety of musical idioms.
02. Demonstrate competence in basic keyboard skills.
03. Demonstrate knowledge of music history and literature.
04. Demonstrate basic computer literacy.
05. Understand the operation of basic reproduction, reinforcement and recording audio equipment.
06. Demonstrate proficiency in a specific area of applied music.

07. Perform transactions with music industry suppliers.
08. Perform specified management skills.
09. Interpret, apply, use and employ knowledge of legal issues of copyright and contracts.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial — SECONDARY NUMBER:
PROGRAM TITLE: Music Production Technology — POSTSECONDARY NUMBER:

01.0 WRITE, ANALYZE, HEAR AND INTERPRET RHYTHMIC, MELODIC AND HARMONIC PATTERNS IN A VARIETY OF MUSICAL IDIOMS.--The student will be able to:

01.01 Demonstrate knowledge of musical calligraphy.
01.02 Write original melodies, chord progressions and harmonizations.
01.03 Analyze the style and technical content of selected written and performed music.
01.04 Apply listening skills for hearing live and recorded music.
01.05 Interpret choral and instrumental music.
01.06 Recall names and performance characteristics of band and orchestral instruments.

02.0 DEMONSTRATE COMPETENCE IN BASIC KEYBOARD SKILLS--The student will be able to:

02.01 Play scales and chord progressions in all keys.
02.02 Sight read selected musical examples (homophonic texture).
02.03 Play standard jazz progressions.
02.04 Harmonize melodic lines with various accompaniment patterns.
02.05 Play melodies by ear.
02.06 Improvise melodies (various idioms, styles, key centers/meters) to specified harmonic patterns.
02.07 Interpret and perform from a lead sheet.

03.0 DEMONSTRATE KNOWLEDGE OF MUSIC HISTORY AND LITERATURE--The student will be able to:

03.01 Contrast stylistic periods of compositions and performance through analysis of:
    a. music scores
    b. live and recorded performances
03.02 Recall the names and primary contributions of principal composers from the Renaissance through 20th Century.
03.03 Identify primary forms of music for all performing media.
03.04 Identify the components of musical form (motives, phrases, etc.) visually and aurally.
03.05 Associate particular forms of music with particular stylistic periods.
03.06 List the names of instruments which were prevalent in particular historical periods of music.

04.0 DEMONSTRATE BASIC COMPUTER LITERACY--The student will be able to:

04.01 Demonstrate proficiency in using MIDI instruments to record sounds using a digital sampler.
04.02 Utilize a computer and multiple MIDI instruments.
04.03 Record a single sound track; add multiple sound tracks, and change MIDI voices using the software.

05.0 UNDERSTAND THE OPERATION OF BASIC REPRODUCTION, REINFORCEMENT AND RECORDING AUDIO EQUIPMENT--The student will be able to:

05.01 Generate applications of audio technology as applied to music production.
    a. Appraise musical needs of end user.
    b. Evaluate available audio resources.

c. Organize and create a musical script to meet end user needs.
d. Manage personnel and technical resources for the execution of the project.
e. Evaluate the final project for quality and appropriateness.
f. Interpret available copy information as related to recorded music.

05.02 Formulate strategies for producing multi-track recording.
a. Evaluate production needs for microphone applications.
b. Demonstrate proficiency with multi-track, multi-channeled mixing consoles.
c. Formulate strategies for physical and electronic tape editing.
d. Formulate strategies for multi-track recording to industry standards.
e. Configure audio recording systems for optimal and appropriate use of signal processing equipment.
f. Develop strategies for using musical instrument digital interfacing.

05.03 Interpret multi-track recording for proper musical mix.
a. Configure audio equipment for optimal musical mix.
b. Create a mixing plan.
c. Evaluate the quality of multi-track recording.
d. Interpret musical needs for end user.
e. Supervise equipment operator.
f. Evaluate quality of the final mix to industry standards.

05.04 Formulate strategies for audio reinforcement of music productions.
a. Evaluate performance needs.
b. Evaluate technical as appropriate to given spaces.
c. Configure a sound reinforcement system to meet performance needs.
d. Analyze various audio qualities to achieve proper sound mix.
e. Perform transactions with audio suppliers.
f. Design a plot for proper microphone and speaker placement.

06.0 DEMONSTRATE PROFICIENCY IN A SPECIFIC AREA OF APPLIED MUSIC--The student will be able to:

06.01 Accurately sight read music at simple and moderately difficult levels.
06.02 Perform with stylistic accuracy as a soloist and ensemble member.
06.03 Improvise melodies without music or chord symbols.
06.04 Improvise melodies, given a specific style, meter and tempo using chord symbols.

07.0 PERFORM TRANSACTIONS WITH MUSIC INDUSTRY SUPPLIERS--The student will be able to:

07.01 Research sources for needed equipment, supplies and educational materials.
07.02 Differentiate the levels of quality in the hierarchy of manufacturers, distributors and suppliers.
07.03 Evaluate purchasing agreements including bids, warranties, and maintenance contracts.
07.04 Distinguish the variations in features between similar music related products.
07.05 Execute the purchase of music equipment, supplies and educational materials.

08.0 PERFORM SPECIFIED MANAGEMENT SKILLS--The student will be able to:

08.01 Organize scheduling for live music performances.
08.02 Organize scheduling for recording sessions.

08.03 Interpret budgets for musical events.
08.04 Manage live musical performances.
08.05 Manage music recording sessions.

09.0 INTERPRET, APPLY, USE AND EMPLOY KNOWLEDGE OF LEGAL ISSUES OF COPYRIGHT AND CONTRACTS--The student will be able to:

09.01 Define and implement contractual agreements with unions, agents, managers and other representatives of the commercial music production industry.
09.02 Evaluate and apply copyright and licensing laws.
09.03 Identify potential music marketing areas and manage product distribution.
09.04 Recognize the right of artists and employ successful negotiation of contractual agreements.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Create and write a resume.
10.02 Prepare and compile a work portfolio.
10.03 Identify acceptable work habits.
10.04 Demonstrate competence in job interview techniques.
10.05 Formulate strategy for post graduation.
10.06 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Occupational Safety and Health Technology

CODE NUMBER: Secondary ______ Postsecondary I150701

Florida CIP 0615.070100

SECONDARY
SCHOOL CREDITS __ COLLEGE CREDITS __ POSTSECONDARY ADULT VOCATIONAL CREDITS x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: OSHA @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to prepare students for employment as compliance and enforcement inspectors (21911026), occupational safety and health inspectors (168.167-062), or to provide supplemental training for persons previously or currently employed in a wide range of industrial and technical occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, state and federal safety and workplace health legislation and standards, hazard recognition and avoidance, workplace analysis/safety inspections, and preparation and interpretation of technical reports and data.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this course and provides instruction in workplace hazard recognition, equipment use, safety inspections, and developing costs analyses for corrective actions.

III. SPECIAL NOTE: The typical length of this course for the average achieving student is 40 hours.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate working knowledge of the Occupational Safety and Health Act and standards that relate to a specific industry.
02. Deliver safety instruction effectively.
03. Demonstrate an understanding of employer/employee relationships to develop and maintain a safe working environment.
04. Recognize workplace hazards and corrective action to take.
05. Orient new workers to their jobs so they work in an efficient and safe manner.
06. Develop a safety-training plan for a work site.
07. Complete a job safety analysis.
08. Conduct a workplace safety analysis and write a plan for corrective action.
09. Prepare, analyze, and evaluate technical data.
10. Develop or modify a safety program.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER: ________
PROGRAM TITLE: Occupational Safety and Health Technology
POSTSECONDARY NUMBER: I150701

01.0 DEMONSTRATE A WORKING KNOWLEDGE OF THE OCCUPATIONAL SAFETY AND HEALTH ACT AND STANDARDS THAT RELATE TO A SPECIFIC INDUSTRY--The student will be able to:

01.01 Explain how Congressional action becomes regulation.
01.02 Locate standards for theoretical situations, using a regulation book.

02.0 DELIVER SAFETY INSTRUCTION EFFECTIVELY--The student will be able to:

02.01 Using acceptable teaching/training methods, conduct a safety training session.
02.02 Develop and use a pre-test and post-test.

03.0 DEMONSTRATE AN UNDERSTANDING OF EMPLOYER/EMPLOYEE RELATIONSHIPS TO DEVELOP AND MAINTAIN A SAFE WORKING ENVIRONMENT--The student will be able to:

03.01 Explain how to organize a safety committee.
03.02 Explain the purpose and function of a safety committee.
03.03 Develop an incentive program for a company.
03.04 Explain how unions or employee organizations impact on work procedures and safety.
03.05 Demonstrate an understanding of the Florida "Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

04.0 RECOGNIZE WORK PLACE HAZARDS AND CORRECTIVE ACTION TO TAKE--The student will be able to:

04.01 Identify work place hazards and specify corrective action to be taken.
04.02 Identify potential hazards and explain worker behavior around the hazards.

05.0 ORIENT NEW WORKERS TO THEIR JOBS SO THEY WILL WORK IN AN EFFICIENT AND SAFE MANNER--The student will be able to:

05.01 Explain the importance of properly trained workers, especially in hazardous occupations.
05.02 Develop an outline to use in training workers to do their jobs safely and efficiently.
05.03 Develop a job related pre-test and post-test.

06.0 DEVELOP A SAFETY-TRAINING PLAN FOR A WORK SITE--The student will be able to:

06.01 Identify job skills or tasks required of different occupations or positions in a work place.
06.02 Develop training activities for identified skills that will reduce or eliminate injuries.

07.0 COMPLETE A JOB SAFETY ANALYSIS--The student will be able to:

07.01 Explain the purpose of a job safety analysis (JSA).
07.02 Conduct a JSA on the activities of a specific worker in a specific

industry.

08.0 CONDUCT A WORK PLACE SAFETY ANALYSIS AND WRITE A PLAN FOR CORRECTIVE ACTION--The student will be able to:

08.01 Perform a work place inspection using Occupational Safety and Health Administration (OSHA) Standards.
08.02 Cite specific regulations and standards for items not in compliance during a safety inspection.
08.03 Develop a written plan of alternative solutions or corrective actions with appropriate cost and cost benefit statements.

09.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL DATA--The student will be able to:

09.01 Prepare cost and cost benefit statements for specific corrective actions.
09.02 Analyze and explain accident incidence statistics.

10.0 DEVELOP OR MODIFY A SAFETY PROGRAM--The student will be able to:

10.01 Develop a safety program, given a specific work place situation.
10.02 Modify an existing training program to reflect new circumstances, i.e. new work place hazards.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Office Machine Maintenance

CODE NUMBER: Secondary 8715000   Postsecondary ______

Florida CIP 0647.012200

SECONDARY
SCHOOL CREDITS 6   COLLEGE CREDITS ___   POSTSECONDARY ADULT
VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9   x 9-12   ___ Postsecondary Adult Vocational

___ Postsecondary Vocational   x Other 30,31

CERTIFICATION COVERAGE: BUS MACH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an office machine servicer apprentice (85926651), (633.281-022).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and knowledge of tasks and equipment used in office machine maintenance.

Listed below are the courses that comprise this program when offered at the secondary level:

8715010	Office Machine Maintenance 1
8715020	Office Machine Maintenance 2
8715030	Office Machine Maintenance 3
8715040	Office Machine Maintenance 4
8715050	Office Machine Maintenance 5
8715060	Office Machine Maintenance 6

II. LABORATORY ACTIVITIES: Office machine maintenance laboratory hands-on activities are an integral part of this program. The tools, equipment, material and processes used in the laboratory are similar to those used in business and industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Algebra is recommended as a prerequisite for entry into this program.

Students should not be color blind.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Analyze all phases of DC circuits related to office machine maintenance.
02. Demonstrate a knowledge of and practice all laboratory procedures related to office machine maintenance.
03. Troubleshoot and maintain electronic typewriters.
04. Troubleshoot and maintain electromechanical typewriters.
05. Troubleshoot and maintain electronic printing calculators.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8715000

PROGRAM TITLE: Office Machine Maintenance POSTSECONDARY NUMBER: ______

01.0 ANALYZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.01 Solve basic algebraic problems as applicable to electronics (program prerequisite).
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate Ohms Law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.
01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series-parallel circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Construct series-parallel circuits.
01.16 Analyze voltage dividers (loaded and unloaded).
01.17 Construct voltage dividers (loaded and unloaded).
01.18 Troubleshoot voltage dividers (loaded and unloaded).
01.19 Solve network theorem problems using Kirchhoff, (V & I), Thevenin, Norton, Superposition, and Delta-Wye.
01.20 Analyze maximum power transfer theory.
01.21 Construct maximum power transfer theory.
01.22 Troubleshoot maximum power transfer theory.
01.23 Define magnetic properties of circuits and devices.
01.24 Determine physical and electrical.
01.25 Analyze and measure RL and RD time constants.
01.26 Set up and operate VOM for DC circuits.
01.27 Set up and operate DVM for DC circuits.
01.28 Set up and operate power supplies for DC circuits.
01.29 Set up and operate oscilloscopes for DC circuits.

02.0 DEMONSTRATE A KNOWLEDGE OF AND PRACTICE ALL LABORATORY PROCEDURES RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

02.01 Apply proper safety standards.
02.02 Make electrical connections.
02.03 Identify and use hand tools properly.
02.04 Identify and use power tools properly.
02.05 Handle static sensitive devices.
02.06 Identify and use fasteners (screws, washers, pins, connectors).
02.07 Establish and maintain an effective inventory control system.
02.08 Establish and maintain an effective parts control system for use in laboratory and maintenance vehicles.
02.09 Solder using proper soldering techniques.
02.10 Set up and operate scales.
02.11 Set up and operate micrometers.
02.12 Set up and operate rules.
02.13 Set up and operate drill blocks.
02.14 Set up and operate dial indicators.
02.15 Set up and operate vernier scales.

02.16 Set up and operate mechanical and optical measuring devices.
02.17 Set up and operate height gauges.
02.18 Set up and operate depth gauges.
02.19 Read and convert measurements.
02.20 Perform preventative maintenance according to vendor specifications.
02.21 Develop and implement preventative maintenance schedules.

03.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC TYPEWRITERS--The student will be able to:

03.01 Read and interpret schematic and block diagrams of electronic typewriters.
03.02 Determine the defective status of keyboards.
03.03 Troubleshoot keyboards.
03.04 Remove and replace keyboards or components.
03.05 Perform operating systems check and make minor adjustments to keyboards.
03.06 Perform preventive maintenance on keyboards.
03.07 Determine the defective status of logic boards.
03.08 Troubleshoot logic boards.
03.09 Remove and replace logic boards of components.
03.10 Perform operating systems check and make minor adjustments to logic boards.
03.11 Perform preventive maintenance on logic boards.
03.12 Determine the defective status of printing carriers.
03.13 Troubleshoot printing carriers.
03.14 Remove and replace printing carriers or components.
03.15 Perform operating systems check and make minor adjustments to printing carriers.
03.16 Perform preventive maintenance on printing carriers.
03.17 Determine the defective status of power supplies.
03.18 Troubleshoot power supplies.
03.19 Remove and replace power supplies or components.
03.20 Perform operating systems check and make minor adjustments to power supplies.
03.21 Perform preventive maintenance on power supplies.

04.0 TROUBLESHOOT AND MAINTAIN ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

04.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
04.02 Determine the defective status of escapement mechanisms.
04.03 Troubleshoot escapement mechanisms.
04.04 Remove and replace escapement mechanisms or components.
04.05 Perform operating systems check and make minor adjustments to escapement mechanisms.
04.06 Perform preventive maintenance on escapement mechanisms.
04.07 Determine the defective status of keyboards.
04.08 Troubleshoot keyboards.
04.09 Remove and replace keyboards or components.
04.10 Perform operating systems check and make minor adjustments to keyboards.
04.11 Perform preventive maintenance on keyboards.
04.12 Determine the defective status of printing carriers.
04.13 Troubleshoot printing carriers.
04.14 Remove and replace printing carriers or components.
04.15 Perform operating systems check and make minor adjustment to printing carriers.
04.16 Perform preventive maintenance on printing carriers.
04.17 Determine the defective status of cycle clutch drives including

motor.
04.18 Troubleshoot cycle clutch drives including motor.
04.19 Remove and replace cycle clutch drives including motor or components.
04.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
04.21 Perform preventive maintenance on cycle clutch drives including motor.
04.22 Determine the defective status of op-cam shafts.
04.23 Troubleshoot op-cam shafts.
04.24 Remove and replace op-cam shafts or components.
04.25 Perform operating systems check and make minor adjustments to op-cam shafts.
04.26 Perform preventive maintenance on op-cam shafts.

05.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC PRINTING CALCULATORS--The student will be able to:

05.01 Read and interpret schematic and block diagrams on electronic printing calculators.
05.02 Determine the defective status of power supplies.
05.03 Troubleshoot power supplies.
05.04 Remove and replace power supplies or components.
05.05 Perform operating systems check and make minor adjustments to power supplies.
05.06 Perform preventive maintenance on power supplies.
05.07 Determine defective status of printing carriers.
05.08 Troubleshoot printing carriers.
05.09 Remove and replace printing carriers or components.
05.10 Perform operating systems check and make minor adjustments to printing carriers.
05.11 Perform preventive maintenance on printing carriers.
05.12 Determine defective status of logic boards.
05.13 Troubleshoot logic boards.
05.14 Remove and replace logic boards or components.
05.15 Perform operating systems check and make minor adjustments to logic boards.
05.16 Perform preventive maintenance on logic boards.
05.17 Determine defective status of keyboards.
05.18 Troubleshoot keyboards.
05.19 Remove and replace keyboards or components.
05.20 Perform operating systems check and make minor adjustments to keyboards.
05.21 Perform preventive maintenance on keyboards.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and

perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make appropriate job changes.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate an understanding of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance

PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 1

COURSE NUMBER: 8715010

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in safety procedures, power/hand tool use and measuring.

01.0 ANALYZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series-parallel circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Construct series-parallel circuits.
01.16 Analyze voltage dividers (loaded and unloaded).
01.17 Construct voltage dividers (loaded and unloaded).
01.18 Troubleshoot voltage dividers (loaded and unloaded).
01.19 Solve network theorem problems using Kirchhoff, (V & I), Thevenin, Norton, Superposition, and Delta-Wye.
01.20 Analyze maximum power transfer theory.
01.21 Construct maximum power transfer theory.
01.22 Troubleshoot maximum power transfer theory.
01.23 Define magnetic properties of circuits and devices.
01.24 Determine physical and electrical.
01.25 Analyze and measure RL and RD time constants.
01.26 Set up and operate VOM for DC circuits.
01.27 Set up and operate DVM for DC circuits.
01.28 Set up and operate power supplies for DC circuits.
01.29 Set up and operate oscilloscopes for DC circuits.

02.0 DEMONSTRATE A KNOWLEDGE OF AND PRACTICE ALL LABORATORY PROCEDURES RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

02.01 Apply proper safety standards.
02.02 Make electrical connections.
02.03 Identify and use hand tools properly.
02.04 Identify and use power tools properly.
02.05 Handle static sensitive devices.
02.06 Identify and use fasteners (screws, washers, pins, connectors).
02.07 Establish and maintain an effective inventory control system.
02.08 Establish and maintain an effective parts control system for use in laboratory and maintenance vehicles.
02.09 Solder using proper soldering techniques.
02.10 Set up and operate scales.
02.11 Set up and operate micrometers.
02.12 Set up and operate rules.
02.13 Set up and operate drill blocks.
02.14 Set up and operate dial indicators.
02.15 Set up and operate vernier scales.
02.16 Set up and operate mechanical and optical measuring devices.
02.17 Set up and operate height gauges.

02.18 Set up and operate depth gauges.
02.19 Read and convert measurements.
02.20 Perform preventative maintenance according to vendor specifications.
02.21 Develop and implement preventative maintenance schedules.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance — PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 2 — COURSE NUMBER: 8715020

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in D.C. circuits as related to office machines.

01.0 ANALYZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.01 Solve basic algebraic problems as applicable to electronics (program prerequisite).
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate Ohms Law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance — PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 3 — COURSE NUMBER: 8715030

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experiences in troubleshooting and maintaining electronic typewriters.

03.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC TYPEWRITERS--The student will be able to:

03.01 Read and interpret schematic and block diagrams of electronic typewriters.
03.02 Determine the defective status of keyboards.
03.03 Troubleshoot keyboards.
03.04 Remove and replace keyboards or components.
03.05 Perform operating systems check and make minor adjustments to keyboards.

03.06 Perform preventive maintenance on keyboards.
03.07 Determine the defective status of logic boards.
03.08 Troubleshoot logic boards.
03.09 Remove and replace logic boards of components.
03.10 Perform operating systems check and make minor adjustments to logic boards.
03.11 Perform preventive maintenance on logic boards.
03.12 Determine the defective status of printing carriers.
03.13 Troubleshoot printing carriers.
03.14 Remove and replace printing carriers or components.
03.15 Perform operating systems check and make minor adjustments to printing carriers.
03.16 Perform preventive maintenance on printing carriers.
03.17 Determine the defective status of power supplies.
03.18 Troubleshoot power supplies.
03.19 Remove and replace power supplies or components.
03.20 Perform operating systems check and make minor adjustments to power supplies.
03.21 Perform preventive maintenance on power supplies.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 4 COURSE NUMBER: 8715040

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in troubleshooting and maintaining electromechanical typewriters.

04.0 TROUBLESHOOT AND MAINTAIN ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

04.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
04.02 Determine the defective status of escapement mechanisms.
04.03 Troubleshoot escapement mechanisms.
04.04 Remove and replace escapement mechanisms or components.
04.05 Perform operating systems check and make minor adjustments to escapement mechanisms.
04.06 Perform preventive maintenance on escapement mechanisms.
04.07 Determine the defective status of keyboards.
04.08 Troubleshoot keyboards.
04.09 Remove and replace keyboards or components.
04.10 Perform operating systems check and make minor adjustments to keyboards.
04.11 Perform preventive maintenance on keyboards.
04.12 Determine the defective status of printing carriers.
04.13 Troubleshoot printing carriers.
04.14 Remove and replace printing carriers or components.
04.15 Perform operating systems check and make minor adjustment to printing carriers.
04.16 Perform preventive maintenance on printing carriers.
04.17 Determine the defective status of cycle clutch drives including motor.

04.18 Troubleshoot cycle clutch drives including motor.
04.19 Remove and replace cycle clutch drives including motor or components.
04.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
04.21 Perform preventive maintenance on cycle clutch drives including motor.
04.22 Determine the defective status of op-cam shafts.
04.23 Troubleshoot op-cam shafts.
04.24 Remove and replace op-cam shafts or components.
04.25 Perform operating systems check and make minor adjustments to op-cam shafts.
04.26 Perform preventive maintenance on op-cam shafts.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance — PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 5 — COURSE NUMBER: 8715050

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in troubleshooting and maintaining electronic printing calculators.

05.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC PRINTING CALCULATORS--The student will be able to:

05.01 Read and interpret schematic and block diagrams on electronic printing calculators.
05.02 Determine the defective status of power supplies.
05.03 Troubleshoot power supplies.
05.04 Remove and replace power supplies or components.
05.05 Perform operating systems check and make minor adjustments to power supplies.
05.06 Perform preventive maintenance on power supplies.
05.07 Determine defective status of printing carriers.
05.08 Troubleshoot printing carriers.
05.09 Remove and replace printing carriers or components.
05.10 Perform operating systems check and make minor adjustments to printing carriers.
05.11 Perform preventive maintenance on printing carriers.
05.12 Determine defective status of logic boards.
05.13 Troubleshoot logic boards.
05.14 Remove and replace logic boards or components.
05.15 Perform operating systems check and make minor adjustments to logic boards.
05.16 Perform preventive maintenance on logic boards.
05.17 Determine defective status of keyboards.
05.18 Troubleshoot keyboards.
05.19 Remove and replace keyboards or components.
05.20 Perform operating systems check and make minor adjustments to keyboards.
05.21 Perform preventive maintenance on keyboards.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 6 COURSE NUMBER: 8715060

COURSE DESCRIPTION:

This course will provide instruction and lab experience with employability skills.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.

09.08 Demonstrate knowledge of how to make appropriate job changes.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate an understanding of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Optical Technology

CODE NUMBER: Secondary _______ Postsecondary I150606

Florida CIP 0615.060600

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC MECH @ 7 G ¶TEC CHEM @ 7 G TEC OPTICS @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as opticians (32514211), precision lens technicians (716.280-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, anatomy and physiology of the eye, lens forming and fabricating, developing the skill in performing the manipulative technique required in the practice of ophthalmic technology.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in a laboratory setting using hands-on experiences uses glass and plastic lens, implements and equipment appropriate to the programs content in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1440 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of ophthalmic technology procedures.
02. Define terminologies relating to ophthalmic technology.
03. Identify lenses and prescriptions.
04. Perform math for prescription lens.
05. Use and care for hand tools.
06. Use charts and manuals.
07. Demonstrate understanding of lens surfacing lab procedures.
08. Grind bifocal lenses.
09. Grind special type lenses.
10. Grind prism in all types of lenses.
11. Grind prescription lenses.
12. Demonstrate understanding of finishing lab procedures.
13. Fabricate all types of lenses into frames.
14. Demonstrate special types edges lenses.
15. Grind and fabricate all types of lenses.
16. Demonstrate understanding of procedures for plastics lens labs.
17. Grind and fabricate plastic single vision lenses.
18. Grind and fabricate plastic bifocal lenses.
19. Dye all types of plastic lenses.
20. Maintain optical equipment.
21. Demonstrate appropriate communication skills.
22. Demonstrate appropriate math skills.
23. Demonstrate appropriate understanding of basic science.
24. Demonstrate employability skills.
25. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial — SECONDARY NUMBER: ________

PROGRAM TITLE: Optical Technology — POSTSECONDARY NUMBER: I150606

01.0 DEMONSTRATE UNDERSTANDING OF OPHTHALMIC TECHNOLOGY PROCEDURES--The student will be able to:

01.01 Identify philosophy, job description, job station.
01.02 Clean ophthalmic lab.
01.03 Explain history of glass and plastic.

02.0 DEFINE TERMINOLOGIES RELATING TO OPHTHALMIC TECHNOLOGY--The student will be able to:

02.01 Demonstrate theory of light RX.
02.02 Measure with metric system.
02.03 Explain index of refraction and reflection.
02.04 Identify terminology.
02.05 Identify anatomy and physiology of the eye.

03.0 IDENTIFY LENSES AND PRESCRIPTIONS--The student will be able to:

03.01 Identify types of single vision lenses.
03.02 Identify types of bifocal lenses.
03.03 Identify the diopter system.
03.04 Analyze doctor's prescription.

04.0 PERFORM MATH FOR PRESCRIPTION LENS--The student will be able to:

04.01 Transpose prescription.
04.02 Calculate curves to be ground on lenses.
04.03 Calculate thickness for lens.
04.04 Calculate decentration for lens.
04.05 Calculate prism for lens.
04.06 Combine RX elements.

05.0 USE AND CARE FOR HAND TOOLS--The student will be able to:

05.01 Read a Lensometer.
05.02 Read lens clock and thickness calipers.
05.03 Read brass gauges.
05.04 Explain the ANSI Z80-1 1972 standards.

06.0 USE CHARTS AND MANUALS--The student will be able to:

06.01 Read Base Curve Selection chart.
06.02 Write job tickets.
06.03 Measure with P.D. Ruler, frame and parts.
06.04 Take vertex power test.
06.05 Describe lab safety procedure.
06.06 List procedures for entering surface lab.

07.0 DEMONSTRATE UNDERSTANDING OF LENS SURFACING LAB PROCEDURES--The student will be able to:

07.01 Complete all test-Orientation in surface lab.
07.02 Maintain and clean surface machines daily.
07.03 Grind 4 pair single vision lenses + and - side.

08.0 GRIND BIFOCAL LENSES--The student will be able to:

08.01 Grind 6 pair kryptok lens, sphere and cylinder - side.
08.02 Grind 4 pair flat top lens, sphere and cylinder - side.
08.03 Grind 2 pair curve top lenses - side.
08.04 Grind 2 pair single vision plus cylinder - side.
08.05 Grind 4 pair executive lenses minus side.

09.0 GRIND SPECIAL TYPE LENSES--The student will be able to:

09.01 Grind 2 lens above range of generator on - side.
09.02 Grind 2 pair lenses below - 300 diopter on generator.
09.03 Grind 2 pair myo-disc lenses on minus side.
09.04 Grind 2 pair photo gray lenses.
09.05 Grind 4 pair invisible bifocal lenses.

10.0 GRIND PRISM IN ALL TYPES OF LENSES--The student will be able to:

10.01 Grind 7 pair lenses with prism on all type bifocals.
10.02 Grind 3 pair special type bifocals.
10.03 Grind 4 pair ultex lenses on plus side.

11.0 GRIND PRESCRIPTION LENSES--The student will be able to:

11.01 Cut 6 sphere & cylinder laps.
11.02 Grind 3 pair lens as Post-Test.
11.03 Account for breakage.

12.0 DEMONSTRATE UNDERSTANDING OF FINISHING LAB PROCEDURES--The student will be able to:

12.01 Perform procedures for entering finish lab.
12.02 Clean and maintain machines daily.
12.03 Perform hand beveling on ceramic & diamond wheels.
12.04 Mount lenses into frame (metal & plastic).
12.05 Make patterns.

13.0 FABRICATE ALL TYPES OF LENSES INTO FRAMES--The student will be able to:

13.01 Fabricate glasses using 2 S.V. sphere lens.
13.02 Fabricate glasses using S.V. vision + and - lens.
13.03 Fabricate glasses using 2 kryptok bifocal S.V.
13.04 Fabricate glasses using kryptok bifocal cylinder lens.
13.05 Fabricate glasses using 2 flat top bifocal sphere lens.
13.06 Fabricate glasses using flat top bifocal cylinder lens.
13.07 Fabricate glasses using 2 executive bifocal sphere lens.
13.08 Fabricate glasses using executive bifocal cylinder lens.
13.09 Fabricate glasses using dryptok cylinder lens.
13.10 Fabricate glasses using flat top cylinder lens.
13.11 Fabricate glasses using executive cylinder lens.

14.0 DEMONSTRATE SPECIAL TYPES EDGES ON LENSES--The student will be able to:

14.01 Fabricate glasses using high minus lenses.
14.02 Fabricate glasses using high plus lenses.
14.03 Block lenses for edging using alloy blocker.
14.04 Demonstrate hide-a-bevel.
14.05 Fabricate rimless glasses.
14.06 Fabricate Ultex Spheres.
14.07 Fabricate Ultex Cylinders.
14.08 Fabricate 4 pair glass S.V. lens into frames.
14.09 Account for breakage.

14.10 Fabricate Logo Frames.

15.0 GRIND AND FABRICATE ALL TYPES OF LENSES--The student will be able to:

15.01 Grind and fabricate single vision blanks.
15.02 Grind and fabricate semi-finished - cylinder blanks.
15.03 Grind and fabricate semi-finished + blanks.
15.04 Grind and fabricate semi-finished cylinder blanks.
15.05 Grind and fabricate semi-finished flat top bifocals.
15.06 Grind and fabricate semi-finished kryptok bifocals.
15.07 Grind and fabricate semi-finished curve top bifocals.
15.08 Grind and fabricate compound prism bifocals.
15.09 Grind and fabricate semi-finished oversize blanks.
15.10 Grind and fabricate semi-finished trifocals.
15.11 Grind and fabricate semi-finished occupational bifocal.
15.12 Grind and fabricate semi-finished Ex. bifocal.
15.13 Account for breakage.
15.14 Align frames.
15.15 Fabricate 4 pair glass lens into cylinder frame.
15.16 Fabricate 4 pair bifocal lens into metal frame.

16.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES FOR PLASTIC LENS LAB--The student will be able to:

16.01 Complete all job tickets-orientation of plastic lens lab.
16.02 Clean and maintain machines daily.
16.03 Demonstrate Sag-Dial and Computer.

17.0 GRIND AND FABRICATE PLASTIC SINGLE VISION LENSES--The student will be able to:

17.01 Grind 2 pair S.V. sphere.
17.02 Grind 2 pair S.V. cylinder.
17.03 Fabricate 4 pair S.V. lens.
17.04 Grind and fabricate 2 pair S.V. high cylinder.

18.0 GRIND AND FABRICATE PLASTIC BIFOCAL LENSES--The student will be able to:

18.01 Grind and fabricate 3 pair kryptok.
18.02 Grind and fabricate 3 pair flat top.
18.03 Grind and fabricate 2 pair special type bifocal.
18.04 Grind and fabricate 4 pair Executive bifocals.

19.0 DYE ALL TYPES OF PLASTIC LENSES--The student will be able to:

19.01 Dye plastic lens - 6 pairs.
19.02 Account for breakage.
19.03 Fabricate 4 pair plastic lens plastic frame.
19.04 Fabricate 4 pair plastic lens metal frame.

20.0 MAINTAIN OPTICAL EQUIPMENT--The student will be able to:

20.01 Clean tanks and edgers.
20.02 Check size and axis of edgers.
20.03 Change generator tanks.
20.04 Check generator curve thickness and prism.
20.05 Clean hand stone, tanks and sponges.
20.06 Clean and fix reclaim tanks.
20.07 Remove and replace air filters in all labs.

21.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able

to:

21.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
21.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
21.03 Read and follow written and oral instructions.
21.04 Answer and ask questions coherently and concisely.
21.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
21.06 Demonstrate appropriate telephone/communication skills.

22.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

22.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
22.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
22.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
22.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
22.05 Demonstrate an understanding of federal, state and local taxes and their computation.

23.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

23.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
23.02 Draw conclusions or make inferences from data.
23.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
23.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

24.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

24.01 Conduct a job search.
24.02 Secure information about a job.
24.03 Identify documents which may be required when applying for a job interview.
24.04 Complete a job application form correctly.
24.05 Demonstrate competence in job interview techniques.
24.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
24.07 Identify acceptable work habits.
24.08 Demonstrate knowledge of how to make job changes appropriately.
24.09 Demonstrate acceptable employee health habits.
24.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

25.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

25.01 Define entrepreneurship.
25.02 Describe the importance of entrepreneurship to the American economy.
25.03 List the advantages and disadvantages of business ownership.

25.04 Identify the risks involved in ownership of a business.
25.05 Identify the necessary personal characteristics of a successful entrepreneur.
25.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Ornamental Iron Work

CODE NUMBER: Secondary _______ Postsecondary I480599

Florida CIP 0648.059901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ORNA IRON @ 7 G METAL WORK @ 7 G WELDING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welding machine operators (91705757), ornamental iron workers (809.381-022), ornamental iron helpers (869.664-014), ornamental-metal workers (619.360-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, installation of prefabricated ornamental ironwork, fabrication of custom ornamental ironwork, including metal door and window frames, motor driven and power operated doors, metal trim and paneling, and aluminum curtain-wall frames.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in cutting, shaping, welding, work from blueprints, manufacturers procedures and verbal descriptions.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1560 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Erect ornamental iron.
02. Fabricate reinforcing steel.
03. Erect structural steel.
04. Perform rigging operations.
05. Perform reeving operations.
06. Identify proper sling use.
07. Perform heavy rigging.
08. Access structures.
09. Read and interpret blueprints.
10. Perform welding operations.
11. Erect steel fences.
12. Apply metal decking.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Ornamental Iron Work POSTSECONDARY NUMBER: I480599

01.0 ERECT ORNAMENTAL IRON--The student will be able to:

01.01 Understand the use of squares, levels, transits, rulers and other tools for preparing layout work.
01.02 Identify various types of doors and frames that are used in iron working.
01.03 Demonstrate how to erect doors and frames.
01.04 Identify types of gratings and grills and methods of installing them.
01.05 Identify types of handrails and methods of installing them.
01.06 Identify types of stairways and rails and methods of installing them.

02.0 FABRICATE REINFORCING STEEL--The student will be able to:

02.01 Fabricate reinforcing steel.
02.02 Erect, place and tie reinforcing steel.

03.0 ERECT STRUCTURAL STEEL--The student will be able to:

03.01 Identify various connections of beams, columns, and any other structural members.
03.02 Execute connections of beams, columns, and other structural members.
03.03 Execute proper method of hooking steel beams and columns for hoisting in building erection.
03.04 Demonstrate correct hand signals for all cranes, derricks and gin poles.
03.05 Assemble various types of cranes, derricks and gin poles.
03.06 Identify types of splices used for all phases of wire rope.
03.07 Demonstrate all types of splicing for wire rope.

04.0 PERFORM RIGGING OPERATIONS--The student will be able to:

04.01 Identify rigging hardware.
04.02 Describe and demonstrate, when possible, rigging applications.

05.0 PERFORM REEVING OPERATIONS--The student will be able to:

05.01 Identify different types of blocks and their safe working load.
05.02 Compute the mechanical advantages of compound tackle systems.
05.03 Reeve and lace wire rope through the blocks and sheaves.

06.0 IDENTIFY PROPER SLING USE--The student will be able to:

06.01 Identify types of slings.
06.02 Identify practical uses of slings.

07.0 PERFORM HEAVY RIGGING--The student will be able to:

07.01 Identify center of gravity and picking points for heavy loads.
07.02 Identify methods to hoist heavy loads correctly into place.

08.0 ACCESS STRUCTURES--The student will be able to:

08.01 Identify access structures.

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08.02 Identify methods of rigging access structure.

09.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

09.01 Identify types of blueprints.
09.02 Identify blueprint symbols, abbreviations, markings and details.
09.03 Identify control and measurement lines.
09.04 Understand the translation from blueprint to practical use.

10.0 PERFORM WELDING OPERATIONS--The student will be able to:

10.01 Identify types of welds.
10.02 Identify types of welding machines, rods and wires.
10.03 Demonstrate practical applications of various types of welding procedures on ferrous and non-ferrous metals to enable students to pass welding certification tests.
10.04 Understand the principles of free-standing towers and guy towers and the methods of erecting them.

11.0 ERECT STEEL FENCES--The student will be able to:

11.01 Layout steel fences.
11.02 Erect steel fences.

12.0 APPLY METAL DECKING--The student will be able to:

12.01 Identify various types of metal decking and sheeting.
12.02 Understand proper handling of placing of metal decking and sheeting.
12.03 Demonstrate proper placing or erection techniques for metal decking and sheeting.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.
13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Painting and Decorating

CODE NUMBER: Secondary 8721500   Postsecondary I460408

Florida CIP 0646.040800

SECONDARY SCHOOL CREDITS 4   COLLEGE CREDITS ____   POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9   x 9-12   x Postsecondary Adult Vocational

____ Postsecondary Vocational   x Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G   PAINTING @ 7 G
¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as painters and paper hangers (87402554), painters (840.381-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, materials and cost estimates, surface preparation, paint mixing and matching, application procedures, special effects, wall covering application, blueprint reading, ladder and scaffold erection and use, selection, application and care of materials, use of hand and power tools, and use of current industry standards, practices and techniques.

Listed below are the courses that comprise this program when offered at the secondary level:

8721510	Painting and Decorating 1
8721520	Painting and Decorating 2
8721530	Painting and Decorating 3
8721540	Painting and Decorating 4

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in preparation of surfaces, application of coatings and coverings, scaffold and ladder erection, mixing and matching paints and application of wallpaper.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 600 hours.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely.
02. Select, use, and care for tools and equipment, scaffolding and ladders.
03. Demonstrate proficiency in the preparation of surfaces.
04. Demonstrate the use of the materials used in painting.
05. Demonstrate proper application of materials used in painting using brushes, rollers and sprayers
06. Fit and apply wallpaper.
07. Mix colors and match samples.
08. Apply stains, varnishes, lacquers and acrylics.
09. Use chemical stripping and cleaning solutions.
10. Estimate costs and provide quotations.
11. Advise on the suitability of different materials.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8721500

PROGRAM TITLE: Painting and Decorating POSTSECONDARY NUMBER: I460408

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY--The student will be able to:

01.01 Explain the hazards of working above ground and appropriate work habits.
01.02 Explain and demonstrate safe use of hand and power tools.

02.0 SELECT, USE AND CARE FOR TOOLS AND EQUIPMENT, SCAFFOLDING AND LADDERS--The student will be able to:

02.01 Erect a scaffold.
02.02 Demonstrate proper use of folding and extension ladders.
02.03 Explain proper storage of flammable materials.
02.04 Explain and demonstrate proper cleaning and storage of tools and equipment.

03.0 DEMONSTRATE PROFICIENCY IN PREPARATION OF SURFACES--The student will be able to:

03.01 Prepare new wood surfaces for coating with paint.
03.02 Remove old wall coverings.
03.03 Prepare and seal walls for wallcoverings.
03.04 Prime plaster and sheetrock surfaces for painting.
03.05 Prepare metal surfaces for painting.
03.06 Use sandblasting equipment to remove old surface coatings.
03.07 Spackle/patch sheetrock and plaster surfaces.

04.0 DEMONSTRATE THE USE OF THE MATERIALS USED IN PAINTING--The student will be able to:

04.01 Explain the criteria for selection and use of water and chemical based coatings.
04.02 Select brushes, roller covers and spray equipment for coatings to be used.

05.0 DEMONSTRATE PROPER APPLICATION OF MATERIALS USED IN PAINTING USING BRUSHES, ROLLERS, AND SPRAYERS--The student will be able to:

05.01 Paint a surface using a brush.
05.02 Paint trim with a brush.
05.03 Paint a surface with a roller.
05.04 Spray paint a surface.

06.0 FIT AND APPLY WALLPAPER--The student will be able to:

06.01 Select and mix paste (for non-prepasted) wall coverings.
06.02 Apply grass cloth wall covering.
06.03 Apply paper wall covering.
06.04 Apply foil wall covering.
06.05 Apply mylar wall covering.
06.06 Apply cloth-backed wallcovering.
06.07 Match a pattern to a corner.
06.08 Fit wall paper around a window and door.

07.0 MIX COLORS AND MATCH SAMPLES--The student will be able to:

07.01 Identify fundamental colors.

07.02 Explain the process of mixing to arrive at custom colors or tints.
07.03 Mix paint to match a given sample.

08.0 APPLY STAINS, VARNISHES, LACQUERS AND ACRYLICS--The student will be able to:

08.01 Stain woodwork to a uniform color.
08.02 Stain wood to match a sample.
08.03 Seal wood for finishing.
08.04 Apply a varnish finish to a prepared wood surface.
08.05 Apply an oil finish to a prepared wood surface.
08.06 Apply a lacquer finish to a prepared wood surface.
08.07 Apply an acrylic finish to a prepared wood surface.

09.0 USE CHEMICAL STRIPPING AND CLEANING SOLUTIONS--The student will be able to:

09.01 Remove a finish from a painted surface using a chemical solution.
09.02 Use prepared solutions to clean a surface.
09.03 Apply rust inhibitors to metal surfaces.

10.0 ESTIMATE COST AND PROVIDE QUOTATIONS--The student will be able to:

10.01 Compute number of rolls of wallpaper required for a specified job.
10.02 Compute amount of paint for a specified job.

11.0 ADVISE ON SUITABILITY OF DIFFERENT MATERIALS--The student will be able to:

11.01 Select a suitable type of wallcovering based on surface of wall and environment.
11.02 Select a suitable type of coating based on surface, anticipated wear and environment.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student

will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Painting and Decorating
PROGRAM NUMBER: 8721500
COURSE TITLE: Painting and Decorating 1
COURSE NUMBER: 8721510

COURSE DESCRIPTION:

This course is designed to provide instruction in safe and proper use and care of related tools and equipment proper safety practices, the use storage and disposal materials.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY--The student will be able to:

01.01 Explain the hazards of working above ground and appropriate work habits.
01.02 Explain and demonstrate safe use of hand and power tools.

02.0 SELECT, USE AND CARE FOR TOOLS AND EQUIPMENT, SCAFFOLDING AND LADDERS--The student will be able to:

02.01 Erect a scaffold.
02.02 Demonstrate proper use of folding and extension ladders.
02.03 Explain proper storage of flammable materials.
02.04 Explain and demonstrate proper cleaning and storage of tools and equipment.

03.0 DEMONSTRATE PROFICIENCY IN PREPARATION OF SURFACES--The student will be able to:

03.01 Prepare new wood surfaces for coating with paint.
03.02 Remove old wall coverings.
03.03 Prepare and seal walls for wallcoverings.
03.04 Prime plaster and sheetrock surfaces for painting.
03.05 Prepare metal surfaces for painting.
03.06 Use sandblasting equipment to remove old surface coatings.
03.07 Spackle/patch sheetrock and plaster surfaces.

09.0 USE CHEMICAL STRIPPING AND CLEANING SOLUTIONS--The student will be able to:

09.01 Remove a finish from a painted surface using a chemical solution.
09.02 Use prepared solutions to clean a surface.
09.03 Apply rust inhibitors to metal surfaces.

10.0 ESTIMATE COST AND PROVIDE QUOTATIONS--The student will be able to:

10.01 Compute number of rolls of wallpaper required for a specified job.
10.02 Compute amount of paint for a specified job.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.

12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Painting and Decorating — PROGRAM NUMBER: 8721500

COURSE TITLE: Painting and Decorating 2 — COURSE NUMBER: 8721520

COURSE DESCRIPTION:

This course is designed to provide instruction in the proper use and care of painting equipment, selection, mixing and application of materials used in painting.

04.0 DEMONSTRATE THE USE OF THE MATERIALS USED IN PAINTING--The student will be able to:

04.01 Explain the criteria for selection and use of water and chemical based coatings.
04.02 Select brushes, roller covers and spray equipment for coatings to be used.

05.0 DEMONSTRATE PROPER APPLICATION OF MATERIALS USED IN PAINTING USING BRUSHES, ROLLERS, AND SPRAYERS--The student will be able to:

05.01 Paint a surface using a brush.
05.02 Paint trim with a brush.
05.03 Paint a surface with a roller.
05.04 Spray paint a surface.

07.0 MIX COLORS AND MATCH SAMPLES--The student will be able to:

07.01 Identify fundamental colors.
07.02 Explain the process of mixing to arrive at custom colors or tints.
07.03 Mix paint to match a given sample.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the

proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Painting and Decorating	PROGRAM NUMBER:	8721500
COURSE TITLE:	Painting and Decorating 3	COURSE NUMBER:	8721530

COURSE DESCRIPTION:

This course is designed to provide instruction in the preparation of surfaces for finishes, the selection, mixing and application of stains, varnishes, lacquers and finishes.

08.0 APPLY STAINS, VARNISHES, LACQUERS AND ACRYLICS--The student will be able to:

- 08.01 Stain woodwork to a uniform color.
- 08.02 Stain wood to match a sample.
- 08.03 Seal wood for finishing.
- 08.04 Apply a varnish finish to a prepared wood surface.
- 08.05 Apply an oil finish to a prepared wood surface.
- 08.06 Apply a lacquer finish to a prepared wood surface.
- 08.07 Apply an acrylic finish to a prepared wood surface.

11.0 ADVISE ON SUITABILITY OF DIFFERENT MATERIALS--The student will be able to:

- 11.01 Select a suitable type of wallcovering based on surface of wall and environment.
- 11.02 Select a suitable type of coating based on surface, anticipated wear and environment.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Painting and Decorating	PROGRAM NUMBER:	8721500
COURSE TITLE:	Painting and Decorating 4	COURSE NUMBER:	8721540

COURSE DESCRIPTION:

06.0 FIT AND APPLY WALLPAPER--The student will be able to:

- 06.01 Select and mix paste (for non-prepasted) wall coverings.
- 06.02 Apply grass cloth wall covering.
- 06.03 Apply paper wall covering.
- 06.04 Apply foil wall covering.
- 06.05 Apply mylar wall covering.
- 06.06 Apply cloth-backed wallcovering.
- 06.07 Match a pattern to a corner.
- 06.08 Fit wall paper around a window and door.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Photographic Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0610.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS _x_ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

_x_ Postsecondary Vocational ____ Other_________________________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a photographic technician, quality control technician (976.267-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, using film, cameras, chemicals, photographic papers, laboratory practices, photographic equipment, and technical recording and reporting.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, test equipment, materials and processes used in the photography program similar to those used in industry. Students should be able to use the various types of precision equipment found in general use throughout the photography industry for the purpose of photographing, processing and presenting photography.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).
04. Operate various format cameras.
05. Finish photographs.
06. Apply lighting techniques.
07. Take studio photographs.
08. Reproduce photographic media.
09. Process color film.
10. Print color photographs.
11. Produce media presentations.
12. Demonstrate competencies required to manage a photographic business.
13. Take photographs for news media.
14. Apply quality control.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Photographic Technology POSTSECONDARY NUMBER: ______

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.02 Hand-process black and white film.
01.03 Print black and white photographs.
01.04 Process black and white paper.
01.05 Process high contrast film.
01.06 Perform toning skills.
01.07 Produce pan masking.
01.08 Produce black and white print using automated processing.

02.0 CONTROL EXPOSURES--The student will be able to:

02.01 Set appropriate F-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.
03.02 Compose photographs.
03.03 Take still photographs.
03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use a 2¼ format camera.
04.02 Use a view camera.
04.03 Use a front screen projection system.
04.04 Use 8 X 10 format.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.
05.03 Apply print retouching.
05.04 Apply color lacquer spray.
05.05 Apply photo enhancement.

06.0 APPLY LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.
06.04 Take photographs with quartz lighting.
06.05 Take photographs with parabolic lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.
07.03 Take industrial photographs.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.

08.02 Copy transparencies.
08.03 Make internegatives.
08.04 Make a translite.
08.05 Make a halftone print.
08.06 Identify and define color separation.

09.0 PROCESS COLOR FILM--The student will be able to:

09.01 Hand process color negatives and transparencies.
09.02 Process color negatives and transparencies with automation.
09.03 Mix color film chemistry and maintain replenishment.

10.0 PRINT COLOR PHOTOGRAPHS--The student will be able to:

10.01 Process color paper.
10.02 Print color negatives.
10.03 Print color negatives using color analyzer.
10.04 Mix color paper chemistry and maintain replenishment.
10.05 Print color transparencies.

11.0 PRODUCE MEDIA PRESENTATIONS--The student will be able to:

11.01 Prepare script for slide presentation.
11.02 Shoot slides for slide presentation.
11.03 Produce slide presentation.
11.04 Prepare script for video presentation.
11.05 Shoot video tapes.
11.06 Produce video presentation.
11.07 Prepare storyboard for slide presentation.
11.08 Record sound for slide presentation.
11.09 Record sound for video presentation.

12.0 DEMONSTRATE COMPETENCIES REQUIRED TO MANAGE A PHOTOGRAPHIC BUSINESS--The student will be able to:

12.01 Apply communication skills.
12.02 Apply human relations skills.
12.03 Set rates for photographic work.
12.04 Maintain shop records and files.
12.05 Develop effective advertising.
12.06 Maintain presentational portfolio.
12.07 Analyze potential market area.
12.08 Analyze and develop a marketing plan.
12.09 Perform cost analysis.
12.10 Prepare basic media release
12.11 Apply accounting techniques.

13.0 TAKE PHOTOGRAPHS FOR NEWS MEDIA--The student will be able to:

13.01 Identify photographers legal rights/responsibilities.
13.02 Identify rules/regulations of copyright.
13.03 Take photographs for news media.
13.04 Write captions for photos.
13.05 Identify special camera accessories.
13.06 Identify specialized optics for photojournalism.

14.0 APPLY QUALITY CONTROL--The student will be able to:

14.01 Run control strips.
14.02 Plot control results.
14.03 Graft processors performance.
14.04 Maintain pH control of chemistry.

14.05 Operate densitometer.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.

19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Plastering

CODE NUMBER: Secondary ______ Postsecondary I460409

Florida CIP 0646.040900

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31 ___

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G TROWEL TR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plasterers and stucco masons (87317559), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, mathematics, sketching, basic drafting, safety using scaffolds and ladders, preparation of surfaces and application of plaster and composition moldings.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the application of plaster finishes and moldings to architectural surfaces.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Identify and use materials and finishes.
03. Demonstrate proper use of tools, trestles, scaffolds and ladders.
04. Shape and apply moldings and cornices.
05. Make molds.
06. Apply plaster.
07. Align surfaces using plumb bob, straight edge and spirit level.
08. Create smooth finish surfaces.
09. Create decorative textures and special effects by spraying, brushing, troweling, stippling, or spattering small stones on surface.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Plastering POSTSECONDARY NUMBER: I460409

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Identify building components using a blueprint.
01.02 Recognize commonly used symbols on blueprints
01.03 Produce finished surfaces in accordance to blueprints, or architect's drawings.

02.0 IDENTIFY AND USE MATERIALS AND FINISHES--The student will be able to:

02.01 Mix mortar.
02.02 Mix plaster to designated consistency.
02.03 Install driveit systems.
02.04 Apply hardcoat and putty coat finishes.

03.0 DEMONSTRATE PROPER USE OF TOOLS, TRESTLES, SCAFFOLDS AND LADDERS--The student will be able to:

03.01 Erect scaffolds.
03.02 Work off hod ladder.
03.03 Use measurement instruments and tools to determine dimensions.
03.04 Roughen undercoat with scratcher to provide bond.

04.0 SHAPE AND APPLY MOLDING AND CORNICES--The student will be able to:

04.01 Strike excess plaster.
04.02 Apply plaster using trowel and push template over plaster.
04.03 Apply coat of plaster to wall and press trim to position.
04.04 Mold and install ornamental plaster panels and trim.

05.0 MAKE MOLDS--The student will be able to:

05.01 Shape plaster using template.
05.02 Spread plaster with trowel when installing ornamental trim.

06.0 APPLY PLASTER--The student will be able to:

06.01 Apply scratch coat of plaster to metal or gypsum lath.
06.02 Apply brown coat of plaster to metal or gypsum lath.
06.03 Apply finish coat of plaster to metal or gypsum lath.
06.04 Spread plaster over lath or masonry base using trowel.
06.05 Apply plaster to interior walls.
06.06 Apply plaster to ceilings.

07.0 ALIGN SURFACES USING PLUMB BOB, STRAIGHT EDGE AND SPIRIT LEVEL--The student will be able to:

07.01 Smooth plaster with darby and float to attain uniform thickness.
07.02 Install fiber cornerites.

08.0 CREATE SMOOTH FINISH SURFACES--The student will be able to:

08.01 Produce finished surfaces following instruction.
08.02 Produce finished surfaces using handtools and portable power tools.

09.0 CREATE DECORATIVE TEXTURES AND SPECIAL EFFECTS BY SPRAYING, BRUSHING, TROWELING, STIPPLING, OR SPATTERING SMALL STONES ON SURFACES--The student will be able to:

09.01 Apply plaster with spray gun.
09.02 Spatter surface with small stones to create decorative textures in finish.
09.03 Mark surface of coat with brush and trowel to create decorative textures in finish.
09.04 Produce textured finished surfaces following directions.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.

13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Appliance Service

CODE NUMBER: Secondary 8700310 Postsecondary _______

Florida CIP 0647.0499PA

SECONDARY
SCHOOL CREDITS_1_ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 9-10,30,31

CERTIFICATION COVERAGE: GAS FITTER @ 7 G
APPLI REPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the service trades.

The content includes, but is not limited to the general areas of service trades with emphasis on service trades occupations, sketching plans and drawings, measurement and layout tools, safety with hand and power tools, service of tasks or projects pertinent to the service trades, identify materials used in the service trades, use employability skills to research job and training opportunities in the service trades and leadership skills.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting simulating the service trades. Hands-on experiences with the tools, machines and materials used in the service trades are required.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the appliance service trades.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the service trades.
02. Draw and interpret plans.
03. Use measuring and layout tools.
04. Use hand tools of the service trades.
05. Use power tools of the service trades.

06. Construct projects or complete tasks pertinent to the service trades.
07. Identify materials used in the service trades.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.
13. Use employability skills to research job and training opportunities.
14. Demonstrate leadership skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8700310

PROGRAM TITLE: Practical Appliance Service POSTSECONDARY NUMBER:

01.0 IDENTIFY OCCUPATIONS IN THE SERVICE TRADES--The student will be able to:

01.01 Identify four service trades occupations.
01.02 Relate the types of duties required of workers in each of four service trades areas.
01.03 Describe the working conditions of workers in each of four service trades areas.

02.0 DRAW AND INTERPRET PLANS--The student will be able to:

02.01 Interpret various drawings and diagrams common to the service trades areas.
02.02 Use service manuals to match diagrams with given equipment needing repairs.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Identify common service trades measurement tools.
03.02 Use measuring tools for a job specific to one of the service trades areas.
03.03 Use precision measuring tools common to one of the service trades areas.

04.0 USE HANDTOOLS OF THE SERVICE TRADES--The student will be able to:

04.01 Follow safety rules and procedures.
04.02 Identify and properly use hand tools common to the service trades.

05.0 USE POWER TOOLS OF THE SERVICE TRADES--The student will be able to:

05.01 Follow safety rules established for power equipment.
05.02 Safely use power equipment common to the service trades areas.

06.0 CONSTRUCT PROJECTS OR COMPLETE TASK PERTINENT TO THE SERVICE TRADES--The student will be able to:

06.01 Complete an assigned task in appliance repair.
06.02 Complete an assigned task in customer relations.
06.03 Complete an assigned task in another service trade area.

07.0 IDENTIFY MATERIALS USED IN THE SERVICE TRADES--The student will be able to:

07.01 Identify by name given service trades materials.
07.02 Identify the uses of given service trades materials.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.

08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
11.11 Identify or demonstrate acceptable personal grooming habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.
12.07 Identify basic occupational licensing and insurance.

13.0 USE EMPLOYABILITY SKILLS TO RESEARCH JOB OPPORTUNITIES IN THE SERVICE TRADES--The student will be able to:

13.01 List 3 ways to find a job in the service trades.
13.02 List 3 different local service trades job openings, the qualifications for each and the salary for each.
13.03 List the local training opportunities available in 3 or more service trades.
13.04 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

14.01 Participate as a responsible "team member" during laboratory activities.
14.02 Work cooperatively with others.
14.03 Perform a role in the shop cleanup and housekeeping schedule.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Commercial Foods

CODE NUMBER: Secondary 8700360 Postsecondary _______

Florida CIP 0620.0499PA

SECONDARY
SCHOOL CREDITS_1_ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

____Postsecondary Vocational _x_Other 9-10,30,31

CERTIFICATION COVERAGE: COMM COOK @ 7 G HOME EC 1 @2
QUAN FOOD @ 7 G VOC HME EC @ 4

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the food service industry.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting simulating the food service industry. Hands-on experiences with the utensils, equipment, food and supplies used in the food service industry are required.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the food service industry.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the food service industry.
02. Demonstrate acceptable professional and personal sanitation practices.
03. Demonstrate safe working practices.
04. Demonstrate equipment operation skills.
05. Read and interpret recipes.
06. Use dry, liquid, and weight measurements.
07. Prepare recipes or complete task pertinent to food service trades.
08. Identify foods and materials used in the trade.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education　SECONDARY NUMBER: 8700360

PROGRAM TITLE: Practical Commercial Foods　POSTSECONDARY NUMBER: ___

01.0 IDENTIFY OCCUPATIONS IN THE FOOD SERVICE INDUSTRY--The student will be able to:

01.01 Identify four food service occupations.
01.02 Relate the duties and responsibilities of workers in each of four identified occupations.
01.03 Describe the working conditions of persons employed in each of four identified occupations.

02.0 DEMONSTRATE ACCEPTABLE PROFESSIONAL AND PERSONAL SANITATION PRACTICES.--The student will be able to:

02.01 Chemical/Cleaning Agents

02.01.01 Identify chemicals/cleaning agents and describe and practice proper usage.
02.01.02 Identify and practice proper storage procedures for chemicals/cleaning agents.
02.01.03 Identify and practice personnel handling precautions for caustics and acids.
02.01.04 Identify dangers of food contamination by chemicals/cleaning agents and identify and practice precautions against food contamination by chemicals/cleaning agents.

02.02 Food Borne Illness

02.02.01 Identify food borne illness and possible/probable causes.

02.02.02 Identify and practice preventative measures to preclude the occurrence of food borne illness.

02.03 Personal Sanitation

02.03.01 Recognize and practice personal hygiene standards consistent with aesthetic and sanitation requirements of food service operations.

02.04 Receiving/Dry Stores Area

02.04.01 Recognize and maintain a clean and sanitary receiving/dry stores area.
02.04.02 Clean and sanitize floors and walls.
02.04.03 Recognize and report indications of food spoilage.
02.04.04 Recognize and report indications of insect or rodent infestation.

02.05 Food Preparation Areas

02.05.01 Recognize and maintain clean and sanitary food preparation surfaces.
02.05.02 Clean and sanitize floors and walls.
02.05.03 Recognize and report indications of insect or rodent infestation.

03.0 DEMONSTRATE SAFE WORKING PRACTICES.--The student will be able to:

03.01 Safety Hazards

- 03.01.01 Identify physical safety rules.
- 03.01.02 Identify physical safety hazards.
- 03.01.03 Recognize and correct or report physical safety hazards.
- 03.01.04 Identify electrical safety rules.
- 03.01.05 Identify electrical safety hazards.
- 03.01.06 Recognize and correct or report electrical safety hazards.
- 03.01.07 Identify fire safety rules.
- 03.01.08 Identify fire safety hazards.
- 03.01.09 Recognize and correct or report fire safety hazards.

03.02 First Aid

- 03.02.01 Identify first aid requirements for a commercial food service operation.
- 03.02.02 Prepare subject and perform Heimlich maneuver.

04.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS.--The student will be able to:

04.01 Hand Tools

- 04.01.01 Identify special precautions to be used when working with hand tools.
- 04.01.02 Select and use hand tools in a safe and efficient manner.

04.02 Knives and Cutting Tools

- 04.02.01 Identify special precautions to be used when working with knives and cutting tools.
- 04.02.02 Sharpen correctly knives and cutting tools. Inspect handles and guards and report any discrepancy.
- 04.02.03 Use knives and cutting tools in a safe and efficient manner.

04.03 Ovens, Ranges, Griddles, Fryers, Broilers, and Toasters

- 04.03.01 Identify special precautions to be used when working with ovens, ranges, griddles, fryers, broilers and toasters.
- 04.03.02 Correctly assemble and disassemble equipment. Inspect all parts and report any discrepancy.
- 04.03.03 Operate ovens, ranges, griddles, fryers, broilers and toasters in a safe and efficient manner.

05.0 READ AND INTERPRET RECIPES--The student will be able to:

- 05.01 Select appropriate recipe or recipes for a given food product.
- 05.02 Identify ingredients and required quantities for a given recipe.
- 05.03 Convert recipes for both greater and lesser number of portions.

06.0 USE DRY, LIQUID AND WEIGHT MEASUREMENTS--The student will be able to:

- 06.01 Identify standard volume, liquid and weight, as they apply to commercial food operations.
- 06.02 Convert accurately between standard units of measure as applicable to commercial food operations.

07.0 PREPARE RECIPES OR COMPLETE TASK PERTINENT TO FOOD SERVICE TRADES--The student will be able to:

- 07.01 Identify and select materials for a given recipe.
- 07.02 Prepare given recipe.
- 07.03 Hold product for service.
- 07.04 Garnish and present product as appropriate.
- 07.05 Store reusable portions.

08.0 IDENTIFY FOODS AND MATERIALS USED IN THE TRADE--The student will be able to:

- 08.01 Identify chemical/cleaning agents and their respective use and precautions.
- 08.02 Identify consumable non-food items and their respective uses.
- 08.03 Identify food groups and associated hazards and precautions.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 09.03 Read and follow written and oral instructions.
- 09.04 Answer and ask questions coherently and concisely.
- 09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

- 10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
- 10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
- 10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
- 10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

- 11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
- 11.02 Draw conclusions or make inferences from data.
- 11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
- 11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 12.01 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 12.02 Identify acceptable work habits.
- 12.03 Demonstrate acceptable employee health habits.

12.04 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 Identify the necessary personal characteristics of a successful entrepreneur.
13.04 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Construction Trades

CODE NUMBER: Secondary 8700330 Postsecondary ______

Florida CIP 0646.0499PA

SECONDARY SCHOOL CREDITS __x__ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 _____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__Other 9-10,30,31

CERTIFICATION COVERAGE: TEC CONSTR @ 7 G CARPENTRY @ 7 G
BLDG CONST @ 7 G BLDG MAINT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the construction trades.

The content includes, but is not limited to the general areas of the construction trades with emphasis on construction trades occupations, sketching plans and drawings, measurement and layout tools, safety with hand and power tools, construction of tasks or projects pertinent to the construction trades, identify materials used in the construction trades, use employability skills to research job and training opportunities in the construction trades and leadership skills.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting simulating the construction trades. Hands-on experience with the tools, machines and materials used in the construction trades required.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the construction trades.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the construction trades.
02. Draw and interpret plans.
03. Use measuring and layout tools.
04. Use hand tools for construction work.
05. Use power tools for construction work properly and safely.

06. Construct projects or complete tasks pertinent to the construction trades.
07. Identify materials used in the construction trades.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Use employability skills to research job and training opportunities.
12. Demonstrate leadership skills.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial   SECONDARY NUMBER: 8700330
PROGRAM TITLE: Practical Construction Trades   POSTSECONDARY NUMBER:

01.0 IDENTIFY OCCUPATIONS IN THE CONSTRUCTION TRADES--The student will be able to:

01.01 Identify four construction trades occupations.
01.02 Relate the types of duties required of employees in each of two construction trades areas.
01.03 Describe the working conditions of workers in each of three construction trades areas.

02.0 DRAW AND INTERPRET PLANS--The student will be able to:

02.01 Interpret blueprints of various construction trades.
02.02 Draw freehand sketches of specific construction trade jobs.
02.03 Make a floor plan of a residence showing plumbing and electrical symbols.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Identify common construction trades measurement and layout tools.
03.02 Use measuring tools to layout a given construction trade job to specific dimensions.
03.03 Use precision construction trades measurement tools.

04.0 USE HAND TOOLS FOR CONSTRUCTION WORK--The student will be able to:

04.01 Follow safety rules and procedures.
04.02 Identify and properly use hand tools common to the construction trades.

05.0 USE POWER TOOLS FOR CONSTRUCTION WORK PROPERLY AND SAFELY--The student will be able to:

05.01 Follow safety rules established for power equipment.
05.02 Safely use common construction trades power tools.

06.0 CONSTRUCT PROJECTS OR COMPLETE TASK PERTINENT TO THE CONSTRUCTION TRADES--The student will be able to:

06.01 Prepare a sketched plan and construct a carpentry project.
06.02 Prepare a sketched plan and construct a brick or block laying project.
06.03 Complete an assigned task in another construction trade area.

07.0 IDENTIFY MATERIALS USED IN THE CONSTRUCTION TRADES--The student will be able to:

07.01 Identify by name various types of building materials.
07.02 Identify by name various shapes of concrete block.
07.03 Identify various roofing materials.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and

industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
11.11 Identify or demonstrate acceptable personal grooming habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business

efficiently and effectively.
12.07 Identify basic occupational licensing and insurance.

13.0 USE EMPLOYABILITY SKILLS TO RESEARCH JOB OPPORTUNITIES IN THE CONSTRUCTION TRADES--The student will be able to:

13.01 List 3 ways to find a job in the construction trades.
13.02 List 3 different local construction trades job opening, the qualifications for each and the salary for each.
13.03 List the local training opportunities available in 3 or more construction trades.
13.04 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

14.01 Participate as a responsible "team member" during laboratory activities.
14.02 Work cooperatively with others.
14.03 Perform a role in the shop cleanup and housekeeping schedule.

CURRICULUM FRAMEWORK | PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION | EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Electrical/Electronics

CODE NUMBER: Secondary 8700340 | Postsecondary ______

Florida CIP 0647.0199PA

SECONDARY SCHOOL CREDITS 1 | COLLEGE CREDITS ___ | POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 9-10,30,31

CERTIFICATION COVERAGE: TEC ELEC @ 7 G | ELECTRONIC @ 7 G
RADIO TV @ 7 G | ELECTRICAL @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the electrical/electronics trades.

The content includes, but is not limited to the general areas of the electrical/electronics trades with emphasis on electrical/electronics trades occupations, sketching plans and drawings, measurement and layout tools, safety with hand and power tools, electrical/electronics of tasks or projects pertinent to the electrical/electronics trades, identify materials used in the electrical/electronics trades, use employability skills to research job and training opportunities in the electrical/electronics trades and leadership skills.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the electrical/electronic trades.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the electrical/electronics trades.
02. Draw and interpret schematic diagrams.
03. Use measuring tools and electrical/electronics meters.
04. Use hand tools of the electrical/electronics trades.
05. Use power tools of the electrical/electronics trades.

06. Construct projects or complete tasks pertinent to the electrical/electronics trades.
07. Identify materials used in the electrical/electronics trades.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.
13. Use employability skills to research job and training opportunities.
14. Demonstrate leadership skills.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8700340
PROGRAM TITLE: Practical Electrical/Electronics
POSTSECONDARY NUMBER:

01.0 IDENTIFY OCCUPATIONS IN THE ELECTRICAL/ELECTRONICS TRADES--The student will be able to:

01.01 Identify four electrical/electronics occupations.
01.02 Relate the types of duties required of workers in each of three electrical/electronics trades areas.
01.03 Describe the working conditions of workers in each of three electrical/electronics trades areas.

02.0 DRAW AND INTERPRET SCHEMATIC DIAGRAM--The student will be able to:

02.01 Interpret schematic symbols and diagrams.
02.02 Interpret block diagrams.
02.03 Interpret flow charts.
02.04 Draw a simple schematic diagram.

03.0 USE MEASURING TOOLS AND ELECTRICAL/ELECTRONICS METERS--The student will be able to:

03.01 Identify common electrical/electronics trades measurement tools.
03.02 Use precision electrical/electronics meters to measure specific quantities.

04.0 USE HAND TOOLS OF THE ELECTRICAL/ELECTRONICS TRADES--The student will be able to:

04.01 Follow safety rules and procedures.
04.02 Identify and properly use hand tools common to the electrical/electronics trades.

05.0 USE POWER TOOLS OF THE ELECTRICAL/ELECTRONICS TRADES--The student will be able to:

05.01 Follow safety rules established for power equipment.
05.02 Safely use power tools common to the electrical/electronics trades.

06.0 CONSTRUCT PROJECTS OR COMPLETE TASKS PERTINENT TO THE ELECTRICAL/ELECTRONICS TRADES--The student will be able to:

06.01 Prepare a schematic and wire an electronics project.
06.02 Prepare a circuit diagram and wire a residential circuit.
06.03 Prepare a block diagram and wire a logic circuit on a trainer.

07.0 IDENTIFY MATERIALS USED IN THE ELECTRICAL/ELECTRONICS TRADES--The student will be able to:

07.01 Identify by name various electronics components.
07.02 Identify by name given electrical hardware.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and

industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
11.11 Identify or demonstrate acceptable personal grooming habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business

efficiently and effectively.
12.07 Identify basic occupational licensing and insurance.

13.0 USE EMPLOYABILITY SKILLS TO RESEARCH JOB AND TRAINING OPPORTUNITIES--The student will be able to:

13.01 List 3 ways to find a job in the electrical/electronics trades.
13.02 List 3 different local electrical/electronics trades job openings, the qualifications for each and the salary for each.
13.03 Identify local training opportunities available in 3 electrical/electronics trades areas.
13.04 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in the Florida Statutes Chapter 442.

14.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

14.01 Participate as a responsible "team member" during laboratory activities.
14.02 Work cooperatively with others.
14.03 Perform a role in the shop cleanup and housekeeping schedule.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Engine Mechanics

CODE NUMBER: Secondary 8700320 Postsecondary _______

Florida CIP 0647.0699PA

SECONDARY
SCHOOL CREDITS 1 COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 9-10,30,31

CERTIFICATION COVERAGE: AUTO MECH @ 7 G AUTO IND @ 7 G
TEC MECH @ 7 G GAS ENG RPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the mechanics trades.

The content includes, but is not limited to the general areas of the mechanics trades with emphasis on mechanics trades occupations, sketching plans and drawings, measurement and layout tools, safety with hand and power tools, mechanics of tasks or projects pertinent to the mechanics trades, identify materials used in the mechanics trades, use employability skills to research job and training opportunities in the mechanics trades and leadership skills.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting simulating the mechanics trades. Hands-on experiences with the tools, machines and materials used in the mechanics trades are required.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the mechanics trades.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the mechanics trades.
02. Interpret drawings and manuals.
03. Use measuring and layout tools.
04. Use hand tools of the mechanics trades.
05. Use power tools and equipment of the mechanics trades.
06. Construct projects or complete tasks pertinent to the mechanics

trades.

07. Identify materials used in the mechanics trades.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.
13. Use employability skills to research job and training opportunities.
14. Demonstrate leadership skills.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial　　SECONDARY NUMBER: 8700320

PROGRAM TITLE: Practical Engine Mechanics　　POSTSECONDARY NUMBER:

01.0 IDENTIFY OCCUPATIONS IN THE MECHANICS TRADES--The student will be able to:

01.01 Identify three mechanics trades occupations.
01.02 Relate the types of duties required of workers in each of three mechanics trades areas.
01.03 Describe the working conditions of workers in each of three mechanics trades areas.

02.0 INTERPRET DRAWINGS AND MANUALS--The student will be able to:

02.01 Interpret mechanics trades drawing.s
02.02 Interpret mechanics trade manuals.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Identify common mechanics trades measuring tools.
03.02 Use measuring tools to measure a specific mechanics trade job.
03.03 Use precision mechanics trades measuring tools.

04.0 USE HAND TOOLS OF THE MECHANICS TRADES--The student will be able to:

04.01 Follow safety rules and procedures.
04.02 Identify and properly use hand tools common to the mechanics trades.

05.0 USE POWER TOOLS AND EQUIPMENT OF THE MECHANICS TRADES--The student will able to:

05.01 Follow safety rules established for power equipment.
05.02 Safely use common mechanics trades power tools and equipment.

06.0 CONSTRUCT PROJECTS OR COMPLETE TASK PERTINENT TO THE MECHANICS TRADES--The student will be able to:

06.01 Complete an assigned task in the auto mechanics area.
06.02 Complete an assigned task in the small gas engine area.
06.03 Complete an assigned task in another mechanics area.

07.0 IDENTIFY MATERIALS USED IN THE MECHANICS TRADES--The student will be able to:

07.01 Identify by name various mechanical parts.
07.02 Identify by use of parts catalogs the use of given mechanical parts.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.

08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
11.11 Identify or demonstrate acceptable personal grooming habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.
12.07 Identify basic occupational licensing and insurance.

13.0 USE EMPLOYABILITY SKILLS TO RESEARCH JOB OPPORTUNITIES IN THE MECHANICS

TRADES--The student will be able to:

13.01 List 3 ways to find a job in the mechanics trades.
13.02 List 3 different local mechanics trades job openings, the qualifications for each and the salary for each.
13.03 List the local training opportunities available in 3 or more mechanics trades areas.
13.04 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

14.01 Participate as a responsible "team member" during laboratory activities.
14.02 Work cooperatively with others.
14.03 Perform a role in the shop cleanup and housekeeping schedule.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Practical Metal Work

CODE NUMBER: Secondary 8700350 Postsecondary _______

Florida CIP 0648.0599PA

SECONDARY SCHOOL CREDITS 1 COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational x Other 9-10,30,31

CERTIFICATION COVERAGE: SHEET METAL @ 7 G WELDING @ 7 G
METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide individuals with practical skills, knowledge, and attitudes concerning the metals trades.

The content includes, but is not limited to the general areas of the metals trades with emphasis on metals trades occupations, sketching plans and drawings, measurement and layout tools, safety with hand and power tools, construction of tasks or projects pertinent to the metals trades, identifying materials used in the metals trades, and using employability skills to research job and training opportunities in the metals trades and leadership skills.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting simulating the metals trades. Hands-on experiences with the tools, machines and materials used in the metals trades are required.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional course.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job tile for which the student is being trained must be designated in the IEP master

This course enables individuals to achieve practical competencies and knowledge about the different occupations in the metals trades.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Identify occupations in the metals trades.
02. Draw and interpret plans.
03. Use measuring and layout tools.
04. Use hand tools in metal work.
05. Use power tools of the trade properly and safely.
06. Construct projects or complete tasks pertinent to the metals

trades.
07. Identify materials used in the metals trades.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.
13. Use employability skills to research job and training opportunities.
14. Demonstrate leadership skills.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8700350

PROGRAM TITLE: Practical Metal Work
POSTSECONDARY NUMBER:

01.0 IDENTIFY OCCUPATIONS IN THE METALS TRADES--The student will be able to:

01.01 Identify four metals trades occupations.
01.02 Relate the types of duties required of employees in each of two metals trades areas.
01.03 Describe the working conditions of employees in each of two metals trades areas.

02.0 DRAW AND INTERPRET PLANS--The student will be able to:

02.01 Interpret various metals trades plans.
02.02 Draw freehand sketches of specific metals trades projects with dimensions.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Identify common metals trades measurement and layout tools.
03.02 Use measuring tools to layout a given metals trade job to specific dimensions.
03.03 Use precision metals trades measurement tools.

04.0 USE HAND TOOLS IN METAL WORK--The student will be able to:

04.01 Follow safety rules and procedures.
04.02 Identify and properly use hand tools common to the sheetmetals, machine shop and welding trades.

05.0 USE POWER TOOLS OF THE TRADE PROPERLY AND SAFELY--The student will be able to:

05.01 Follow safety rules established for power equipment.
05.02 Safely use common machine shop, welding and sheetmetal trades power tools and equipment.

06.0 CONSTRUCT PROJECTS OR COMPLETE TASK PERTINENT TO THE METALS TRADES--The student will be able to:

06.01 Prepare a sketched working drawing, select materials and construct a useful sheetmetal project.
06.02 Prepare a sketched working drawing, select materials and construct a useful machine shop project.
06.03 Prepare a sketched working drawing, select materials and construct a useful welding project.

07.0 IDENTIFY MATERIALS USED IN THE METALS TRADES--The student will be able to:

07.01 Identify by name given sheetmetal samples.
07.02 Identify by name given steel structural shapes.
07.03 Identify the uses of common metals used in machine shop work.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to

accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.
11.11 Identify or demonstrate acceptable personal grooming habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.

12.06 Identify the business skills needed to operate a small business efficiently and effectively.
12.07 Identify basic occupational licensing and insurance.

13.0 USE EMPLOYABILITY SKILLS TO RESEARCH JOB AND TRAINING OPPORTUNITIES--The student will be able to:

13.01 List 3 ways to find a job in the metals trades.
13.02 List 3 different local metals trades job openings, the qualifications for each and the salary for each.
13.03 List the local training opportunities available in 3 or more metals trades areas.
13.04 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE LEADERSHIP SKILLS--The student will be able to:

14.01 Participate as a responsible "team member" during laboratory activities.
14.02 Work cooperatively with others.
14.03 Perform a role in the shop cleanup and housekeeping schedule.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Precision Metal Fabrication

CODE NUMBER: Secondary ________ Postsecondary I480504

Florida CIP 0648.050400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: SHEETMETAL @ 7 G METAL WORK @ 7 G WELDING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as structural metal fabricators (91714752), metal fabricators-assemblers (809.381-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following; measurement and layout, planning and design, sheetmetal work, structural steel, welding, mechanical fasteners, metal properties, heat treating and metalworking tools.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: measuring and layout tools, bench metal operations, electric metal bonding operations, gas welding and cutting operations, sheetmetal operations, grinding and sharpening tools and metalworking machines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number

corresponds to a grade equivalent score obtained on a state designated basic skills examination.
To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate basic metal fabrication skills.
02. Demonstrate ability to read plans and drawings.
03. Perform measuring and layout operations.
04. Describe metals and their properties.
05. Operate metalworking machines.
06. Perform metal fabrication operations.
07. Perform gas welding and cutting operations.
08. Perform electric metal-bonding operations.
09. Perform assembly operation.
10. Demonstrate ability to apply geometric form and position control.
11. Organize and plan work.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate and practice employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Precision Metal Fabrication POSTSECONDARY NUMBER: I480504

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety and operating rules and practices.
01.02 Maintain a clean and orderly shop.
01.03 Make job-related decimal and fraction calculations.
01.04 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts and tables.
01.07 Compute feet, inches and yards.
01.08 Use the protractor to measure angles to nearest degree.
01.09 Use the protractor and triangles to draw angles.
01.10 Demonstrate proper use of material handling techniques.
01.11 Solve job-related problems using basic formulas.
01.12 Solve job-related problems using basic geometry.
01.13 Solve job-related problems using basic trigonometry.
01.14 Calculate the amount of material that is required to fabricate project.
01.15 Calculate machine feed and speed by using formulas.
01.16 Calculate set back and bend allowance.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able o:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/detail views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint abbreviations.
02.06 Identify dimensioning of radii, round holes, fillets and chamfers.
02.07 Identify screw threads and bolt types.
02.08 Apply dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.
02.10 Read and interpret title block information.
02.11 Identify and interpret rivet call outs.
02.12 Identify and interpret weld call outs.
02.13 Identify and interpret general and local notes.
02.14 Describe the use of assembly blueprints and detail blueprints.

03.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gates and circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.
03.05 Read and measure with steel rules.
03.06 Read and measure with micrometers.
03.07 Read and measure with vernier height gages.
03.08 Read and measure with dial calipers.
03.09 Read and measure with universal bevel protractor.
03.10 Measure with sine bars.
03.11 Read and measure with dial indicators.

03.12 Apply parallel bars, angle plates and surface gages to precision measurement operations.
03.13 Apply "v" blocks to precision measurement operations.
03.14 Use gage blocks in establishing measurement.
03.15 Layout work piece using marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surface plates, depth gages and circumference rules.
03.16 Perform flat pattern bracket layouts.
03.17 Perform cone development, construct radial line and use triangulation.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 Describe the steelmaking process.
04.02 Describe the differences between ferrous and nonferrous metals.
04.03 Describe casting, alloys and forging.
04.04 Identify metals such as galvanized iron and steel, aluminum stainless steel, sheetmetal, copper and brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gages, shapes and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric and air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.
05.12 Operate large belt sander.
05.13 Operate power press brake.
05.14 Operate power metal shear.
05.15 Operate various manual brakes.
05.16 Operate power jitterbug shear.
05.17 Operate bench grinders.
05.18 Operate beverly shear.
05.19 Operate unishear.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges and seams.
06.02 Use hand tools to cut, punch and shear metal.
06.03 Form sheetmetal using a brake, a folder, rolls and a turning machine.
06.04 Join metals using solder, rivets and mechanical fasteners.
06.05 Make fixtures as required (Micarta and Mild Steel).
06.06 Arrange proper setup in vise using safety devices.
06.07 Demonstrate ability to cut various shapes of metal stock.
06.08 Demonstrate ability to bend various shapes of metal stock.
06.09 Inspect fabricated parts.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gages and torches.
07.02 Describe welding equipment safety procedures.

07.03 Demonstrate proper flame settings.
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
07.07 Set up and operate a plasma arc cutting machine.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
08.03 Setup and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning and maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips and choosing filler metal.

09.0 PERFORM ASSEMBLY OPERATION--The student will be able to:

09.01 Identify weld symbols.
09.02 Perform required weld preparation.
09.03 Assist welder in weld operation.
09.04 Identify rivet symbol.
09.05 Install proper diameter holes and prepare metal surfaces for riveting.
09.06 Determine whether rivet is to be "shot" or squeezed.
09.07 Perform proper setup and upset rivets.
09.08 Set up and install blind rivets.

10.0 DEMONSTRATE ABILITY TO APPLY GEOMETRIC FORM AND POSITION CONTROL--The student will be able to:

10.01 Identify material condition and perfect form.
10.02 Identify the eleven form characteristics.
10.03 Identify the two position characteristics.
10.04 Identify the seven different tolerance zones.
10.05 Identify datum symbols.
10.06 Identify datum planes.
10.07 Identify datum axis.
10.08 Identify datum centerplane.
10.09 Identify the three plan datum system and multiple datums.
10.10 Identify material condition modifiers.
10.11 Solve bonus tolerance applications.
10.12 Solve datum zone applications.
10.13 Identify tolerance value indicator.
10.14 Identify American National Standards Institute.
10.15 Identify International Standards Institute.

11.0 ORGANIZE AND PLAN WORK--The student will be able to:

11.01 Interpret blueprints and drawings to acquire proper amount of material.
11.02 Requisition proper tools and equipment to fabricate parts.
11.03 Develop and project plan.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.

16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Printing

CODE NUMBER: Secondary 8739000 Postsecondary ______

Florida CIP 0648.022100

SECONDARY SCHOOL CREDITS __x__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: PRINTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as offset lithographic press setters (92512786), paste-up mechanical assemblers (970.381-018), offset press operators (651.685-018), bindery operators (653.685-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: administrative support operations; pre-press operations; press operations; and finishing operations.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8739010	Printing 1
8739020	Printing 2
8739030	Printing 3
8739040	Printing 4
8739050	Printing 5
8739060	Printing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: customer layouts, desk-top publishing, composition and camera-ready copy; producing line negatives, halftone negatives, and multicolor and process-color negatives; producing single-color proofs and multicolor color proofs; producing printing plates; operating and adjusting duplicators; and operating cutting, folding and binding equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When the cooperative education method of instruction is used, the program length for the secondary program may be increased by a maximum of 2.0 credits. Other related courses which the student should be encouraged to take while enrolled in this program and which will enhance the student's opportunities in the printing industry include: Journalism, English Literature, Algebra, Chemistry, Physics, Typing, Art, Computer Science and business-related courses.

The typical length of this program for the average achieving student is 900 contact hours (1080 clock hours). It is suggested that 40 percent be theoretical training and 60 percent be hands-on laboratory experiences.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing clerical administrative support operations.
02. Demonstrate proficiency in performing mechanical/creative support operations.
03. Demonstrate proficiency in performing pre-press operations.
04. Demonstrate proficiency in performing offset press operations.
05. Demonstrate proficiency in performing finishing/binding operations.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: 8739000
PROGRAM TITLE: Printing
POSTSECONDARY NUMBER: _______

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able to:

01.01 Establish sequence of job operations.
01.02 Apply basic safety rules.
01.03 Use printer's measurements to compute inches and fractions, points and picas, and decimals, percentages and proportions.
01.04 Use job information jacket.
01.05 Identify characteristics of printing papers to specify basic weights, sizes and grades.
01.06 Perform routine maintenance in accordance with manufacturer specifications and established maintenance schedule.
01.07 Comply with established waste and spoilage control measures.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate proper handling of hazardous waste and chemicals.

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL/CREATIVE SUPPORT OPERATIONS--The student will be able to:

2.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each.
02.02 Prepare thumbnail layout.
02.03 Prepare rough layout.
02.04 Prepare comprehensive layout including finished working dummy.
02.05 Size and proportion photographs, line drawings and other copy elements.
02.06 Copyfit and mark up (specify type sizes and styles).
02.07 Prepare computer typesetting equipment for operations.
02.08 Operate typesetting equipment.
02.09 Prepare typesetting processor.
02.10 Process typeset copy.
02.11 Proofread typeset output.
02.12 Paste up mechanical elements including keyline for photographs and tint blocks and ruling.
02.13 Prepare tissue overlay and specify color break, tint percentages and reverses.
02.14 Check and compare completed mechanical to comprehensive layout for final proofing.
02.15 Prepare desk-top publishing equipment for operations.
02.16 Operate desk-top publishing equipment.
02.17 Proofread desk-top copy.
02.18 Modify existing copy utilizing desk-top publishing equipment.
02.19 Prepare multiple-page copy utilizing desk-top publishing equipment.

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each.
03.02 Apply basic principle of photosensitometry, orthochromatic, and panchromatic (including use of gray scale.)
03.03 Apply basic principles of light pertaining to copy board illumination and exposure calculations for all camera functions.
03.04 Apply basic principles of camera optics pertaining to exposure

control and focus and camera extensions pertaining to reductions and enlargements.

03.05 Identify the parts of the process camera and explain their use.
03.06 Apply basic principles of darkroom chemistry.
03.07 Prepare darkroom chemistry.
03.08 Establish basic line exposure and exposure time at 100 percent using standard time and temperature development.
03.09 Apply basic principles of Kodak halftone computer and density guide.
03.10 Establish basic exposures to determine screen range, basic flash, main exposure and bump exposure at 100 percent using standard time and temperature development.
03.11 Produce line negatives to size.
03.12 Inspect and compare line negatives to original mechanical.
03.13 Produce halftones to size.
03.14 Inspect and compare halftones to original copy.
03.15 Make line and halftone diffusion transfer prints.
03.16 Inspect and compare prints to original mechanical.
03.17 Apply basic principles of addition and subtraction color pertaining to the use of filters.
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development.
03.19 Identify the parts of a contact frame and light source and explain their use.
03.20 Produce contacts using orthochromatic and duplicating film, transmission density guide and standard time and temperature development.
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each.
03.22 Apply basic principles of stripping using T-square and triangle.
03.23 Strip 1-color, 1-up layouts.
03.24 Strip 1-color, multiple layouts.
03.25 Strip 1-color, step layouts.
03.26 Strip 1-color, 4-page layouts.
03.27 Strip 1-color, 8-page layouts.
03.28 Strip multiple burn layout (halftone and screen tints.)
03.29 Strip multiple flat color layout.
03.30 Inspect and evaluate flats to original mechanical.
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photo-sensitive additive or subtractive paper or metal plates.
03.32 Produce proofs on diazo or silver paper.
03.33 Process proofs.
03.34 Inspect and evaluate proofs to original mechanical.
03.35 Produce additive or subtractive paper or metal plates.
03.36 Process plates.
03.37 Inspect and evaluate plates to proofs.
03.38 File, handle and retrieve flats and plates.

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS--The student will be able to:

04.01 Identify the equipment and materials used in offset press operations, their parts and functions, and the rules relating to their operation.
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle and dryer.)
04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous.)
04.04 Apply basic principles of offset lithography pertaining to

fountain solutions' chemical components (acid, alkaline and neutral.)

04.05 Apply basic principles of offset lithography pertaining to ph-control and its effects on the lithographic process.

04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper coated and uncoated and various grades within.

04.07 Apply basic principles of offset lithography pertaining to the interrelationships of textured or smooth paper, paper, plastic, metal plates, and conventional or compressible blankets.

04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off, and problems associated with inappropriate use of spray powder).

04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum Arabic and asphaltum.)

04.10 Prepare press for operation by reviewing job-ticket specifications and then selecting appropriate press and materials.

04.11 Prepare press for operation based on interrelationships of lithographic process.

04.12 Mix fountain solution from concentrate.

04.13 Mix ink to PMS (Pantone Matching System) specifications.

04.14 Introduce ink and fountain solution to press in proper sequence.

04.15 Set up and adjust feeder specifications (air blast, vacuum, and choke.)

04.16 Set up and adjust register system to single sheet or stream fed, side guide, and head register.

04.17 Set up and adjust delivery (chute or chain.)

04.18 Mount plate (pack if necessary) to press specifications.

04.19 Mount blanket (pack if necessary) and adjust to press specifications.

04.20 Set impression cylinder to paper thickness and press specifications.

04.21 Set and adjust ink and water rollers pressures to press specifications.

04.22 Make-ready press to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure and sheet registration.

04.23 Inspect and evaluate final make-ready sheet to job-ticket specifications and obtain proof approval to run.

04.24 Set spray powder.

04.25 Produce required number of press sheets to job-ticket specifications.

04.26 Preserve plate for long-term storage.

04.27 Perform press wash-up.

04.28 Perform routine press maintenance to manufacturer's specifications.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS--The student will be able to:

05.01 Identify the equipment and materials used in finishing/binding operations, their parts and functions, and the safety rules relating to their operation.

05.02 Apply basic principles of finishing/binding operations pertaining to prepress paper cutting, post press paper cutting and post bindery cutting (after folding, stitching, etc.)

05.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting.

05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper and finish (coated or uncoated) of paper.

05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations.
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding.
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating.
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering.
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.)
05.10 Apply basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart.)
05.11 Apply basic principles of finishing/binding operations pertaining to package and identification.
05.12 Demonstrate methods of counting sheets, (machine, measurement, weight, and rapid multiple-sheet manual counting by fives, etc).
05.13 Hand jog 8 ½ " x 11" sheets.
05.14 Hand jog 17" x 22" and larger sheets.
05.15 Machine jog sheets.
05.16 Prepare rule-out of press sheet for finishing operations according to job-ticket specifications and approved proof.
05.17 Set up and operate cutter in accordance with rule-out.
05.18 Prepare folding dummy from press sheet in accordance with job-ticket specifications and approved proof.
05.19 Set up and operate folder in accordance with job-ticket specifications and folding dummy.
05.20 Make a single fold.
05.21 Make a multiple parallel fold.
05.22 Make a right angle fold.
05.23 Identify and define slitting, perforating and scoring functions pertaining to folding operations.
05.24 Define collating flat sheets.
05.25 Set up and operate stitcher (side and saddle).
05.26 Set up and operate comb binding machine.
05.27 Perform paper padding functions.
05.28 Define perfect, spiral, and case functions.
05.29 Set up and operate a paper drill for standard looseleaf binder.
05.30 Define die-cutting, embossing, foil stamping and numbering.
05.31 Package and identify completed job according to job-ticket specifications.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Printing

COURSE TITLE: Printing 1

EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1

PROGRAM NUMBER: 8739000

COURSE NUMBER: 8739010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing clerical administrative support operations.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able to:

01.01 Establish sequence of job operations.
01.02 Apply basic safety rules.
01.03 Use printer's measurements to compute inches and fractions, points and picas, decimals, percentages and proportions.
01.04 Use job information jacket.
01.05 Identify characteristics of printing papers to specify basic weights, sizes and grades.
01.06 Perform routine maintenance in accordance with manufacturer specifications and established maintenance schedule.
01.07 Comply with established waste and spoilage control measures.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate proper handling of hazardous waste and chemicals.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Printing

COURSE TITLE: Printing 2

EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1

PROGRAM NUMBER: 8739000

COURSE NUMBER: 8739020

COURSE DESCRIPTION:

This course is designed to provide instruction in performing mechanical/creative support operations.

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL/CREATIVE SUPPORT OPERATIONS--The student will be able to:

02.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each.
02.02 Prepare thumbnail layout.
02.03 Prepare rough layout.
02.04 Prepare comprehensive layout including finished working dummy.
02.05 Size and proportion photographs, line drawings and other copy elements.
02.06 Copyfit and mark up (specify type sizes and styles).
02.07 Prepare computer typesetting equipment for operations.
02.08 Operate typesetting equipment.
02.09 Prepare typesetting processor.
02.10 Process typeset copy.
02.11 Proofread typeset output.
02.12 Paste up mechanical elements including keyline for photographs, tint blocks and ruling.
02.13 Prepare tissue overlay and specify color break, tint percentages and reverses.
02.14 Check and compare completed mechanical to comprehensive layout for final proofing.
02.15 Prepare desk-top publishing equipment for operations.
02.16 Operate desk-top publishing equipment.
02.17 Proofread desk-top copy.
02.18 Modify existing copy utilizing desk-top publishing equipment.
02.19 Prepare multiple-page copy utilizing desk-top publishing equipment.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Printing	PROGRAM NUMBER:	8739000
COURSE TITLE:	Printing 3	COURSE NUMBER:	8739030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing pre-press operations.

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each.
03.02 Apply basic principle of photosensitometry, orthochromatic, and panchromatic (including use of gray scale.)

03.03 Apply basic principles of light pertaining to copy board illumination and exposure calculations for all camera functions.
03.04 Apply basic principles of camera optics pertaining to exposure control and focus and camera extensions pertaining to reductions and enlargements.
03.05 Identify the parts of the process camera and explain their use.
03.06 Apply basic principles of darkroom chemistry.
03.07 Prepare darkroom chemistry.
03.08 Establish basic line exposure and exposure time at 100 percent using standard time and temperature development.
03.09 Apply basic principles of Kodak halftone computer and density guide.
03.10 Establish basic exposures to determine screen range, basic flash, main exposure and bump exposure at 100 percent using standard time and temperature development.
03.11 Produce line negatives to size.
03.12 Inspect and compare line negatives to original mechanical.
03.13 Produce halftones to size.
03.14 Inspect and compare halftones to original copy.
03.15 Make line and halftone diffusion transfer prints.
03.16 Inspect and compare prints to original mechanical.
03.17 Apply basic principles of addition and subtraction color pertaining to the use of filters.
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development.
03.19 Identify the parts of a contact frame and light source and explain their use.
03.20 Produce contacts using orthochromatic and duplicating film, transmission density guide and standard time and temperature development.
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each.
03.22 Apply basic principles of stripping using: T-square and triangle to align, position, and tape film (emulsion side up) on ruled or unruled plastic or paper masking sheets, open windows and opaque on the emulsion side.
03.23 Strip 1-color, 1-up layouts.
03.24 Strip 1-color, multiple layouts.
03.25 Strip 1-color, step layouts.
03.26 Strip 1-color, 4-page layouts.
03.27 Strip 1-color, 8-page layouts.
03.28 Strip multiple burn layout (halftone and screen tints.)
03.29 Strip multiple flat color layout.
03.30 Inspect and compare flats to original mechanical.
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photo-sensitive additive or subtractive paper or metal plates.
03.32 Produce proofs on diazo or silver paper.
03.33 Process proofs.
03.34 Inspect and compare proofs to original mechanical.
03.35 Produce additive or subtractive paper or metal plates.
03.36 Process plates.
03.37 Inspect and compare plates to proofs.
03.38 File, handle and retrieve flats and plates.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.

08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Printing — PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 4 — COURSE NUMBER: 8739040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing offset press operations.

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS--The student will be able to:

04.01 Identify the equipment and materials used in offset press operations, their parts and functions and the rules relating to their operation.
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle and dryer.)
04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous.)
04.04 Apply basic principles of offset lithography pertaining to fountain solutions' chemical components (acid, alkaline and neutral.)
04.05 Apply basic principles of offset lithography pertaining to ph-control and its effects on the lithographic process.
04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper coated and uncoated and various grades within.
04.07 Apply basic principles of offset lithography pertaining to the interrelationships of textured or smooth paper, paper, plastic, metal plates, and conventional or compressible blankets.
04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off, and problems associated with inappropriate use of spray powder.)
04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum Arabic and asphaltum.)
04.10 Prepare press for operation by reviewing job-ticket specifications and then selecting appropriate press and materials.
04.11 Prepare press for operation based on interrelationships of lithographic process.
04.12 Mix fountain solution from concentrate.
04.13 Mix ink to PMS (Pantone Matching System) specifications.
04.14 Introduce ink and fountain solution to press in proper sequence.
04.15 Set up and adjust feeder specifications (air blast, vacuum and choke.)
04.16 Set up and adjust register system to single sheet or stream fed, side guide and head register.

04.17 Set up and adjust delivery (chute or chain.)
04.18 Mount plate (pack if necessary) to press specifications.
04.19 Mount blanket (pack if necessary) and adjust to press specifications.
04.20 Set impression cylinder to paper thickness and press specifications.
04.21 Set and adjust ink and water rollers pressures to press specifications.
04.22 Make-ready press to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure and sheet registration.
04.23 Inspect and evaluate final make-ready sheet to job-ticket specifications and obtain proof approval to run.
04.24 Set spray powder.
04.25 Produce required number of press sheets to job-ticket specifications.
04.26 Preserve plate for long-term storage.
04.27 Perform press wash-up.
04.28 Perform routine press maintenance to manufacturer's specifications.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Printing

PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 5

COURSE NUMBER: 8739050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing finishing/binding.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS--The student will be able to:

05.01 Identify the equipment and materials used in finishing/binding operations, their parts and functions and the safety rules relating to their operation.
05.02 Apply basic principles of finishing/binding operations pertaining to prepress paper cutting, post press paper cutting and post bindery cutting (after folding, stitching, etc.)
05.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting.
05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper and finish (coated or uncoated) of paper.
05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations.
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding.
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating.
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering.
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.)
05.10 Apply basic principles of finishing/binding operations pertaining

to adhesive binding (padding and fan-apart.)
05.11 Apply basic principles of finishing/binding operations pertaining to package and identification.
05.12 Demonstrate methods of counting sheets, (machine, measurement, weight and rapid multiple-sheet manual counting by fives, etc).
05.13 Hand jog 8 ½" x 11" sheets.
05.14 Hand jog 17" x 22" and larger sheets.
05.15 Machine jog sheets.
05.16 Prepare rule-out of press sheet for finishing operations according to job-ticket specifications and approved proof.
05.17 Set up and operate cutter in accordance with rule-out.
05.18 Prepare folding dummy from press sheet in accordance with job-ticket specifications and approved proof.
05.19 Set up and operate folder in accordance with job-ticket specifications and folding dummy.
05.20 Make a single fold.
05.21 Make a multiple parallel fold.
05.22 Make a right angle fold.
05.23 Identify and define slitting, perforating and scoring functions pertaining to folding operations.
05.24 Define collating flat sheets.
05.26 Set up and operate stitcher (side and saddle).
05.27 Set up and operate comb binding machine.
05.28 Perform paper padding functions.
05.29 Define perfect, spiral and case functions.
05.30 Set up and operate a paper drill for standard looseleaf binder.
05.31 Define die-cutting, embossing, foil stamping and numbering.
05.32 Package and identify completed job according to job-ticket specifications including description and/or sample, quantity per package and number of packages, customer purchase order number and job number.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Printing
PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 6
COURSE NUMBER: 8739060

COURSE DESCRIPTION:

This course is designed to provide instruction in the demonstration of employability skills.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as

recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Printing and Graphic Arts

CODE NUMBER: Secondary ______ Postsecondary I480201

Florida CIP 0648.020100

SECONDARY
SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT
VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

_____ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: PRINTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as precision etchers and engravers (89128682), printers (651.380-101). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: administrative support operations, pre-press operations, press operations and finishing operations. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

This program also prepares individuals to set up, operate and maintain preparation, printing and binding equipment used in the printing industry. Graduates of this program will also be prepared for further specialized training and education in Graphic Arts Technology and other related technologies. This program may also serve as apprenticeship related instruction and qualify individuals for advanced standing in apprenticeship training programs.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: production of customer layouts, compositions and camera-ready copy; line negatives, halftone negatives and contacts; stripping of line negatives, halftone negatives and multicolor and process-color negatives; production of printing plates, single color proofs and multicolor color proofs; desk-top publishing; operation and adjustment of duplicators; and operation of cutting, folding and binding equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work

station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Other related courses which the student should be encouraged to take while enrolled in this program and which will enhance the student's opportunities in the printing industry include: Journalism, English, Literature Algebra, Chemistry, Physics, Typing, Art, Computer Science, and business related courses.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing clerical administrative support operations.
02. Demonstrate proficiency in performing mechanical creative support operations.
03. Demonstrate proficiency in performing pre-press operations.
04. Demonstrate proficiency in performing offset press operations.
05. Demonstrate proficiency in performing finishing/binding operations.
06. Demonstrate the ability to perform support operations for laboratory projects.
07. Demonstrate the ability to perform pre-press operations for laboratory projects.
08. Demonstrate the ability to perform offset press operations for laboratory projects.
09. Demonstrate the ability to perform finishing/binding operations for laboratory projects.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Printing and Graphic Arts POSTSECONDARY NUMBER: I480201

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able:

01.01 Establish sequence of job operations.
01.02 Apply basic safety rules.
01.03 Use printer's measurements to compute inches and fractions, points and picas, decimals, percentages, and proportions.
01.04 Use job information jacket.
01.05 Identify characteristics of printing papers to specify basic weights, sizes, and grades.
01.06 Perform routine maintenance in accordance with manufacturer specifications and established maintenance schedule.
01.07 Comply with established waste and spoilage control measures.
01.08 Demonstrate use of material safety data sheets.
01.09 Demonstrate proper handling of hazardous waste and chemicals.

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL CREATIVE SUPPORT OPERATIONS--The student will be able to:

02.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each.
02.02 Prepare thumbnail layouts.
02.03 Prepare rough layouts.
02.04 Prepare comprehensive layouts including a finished working dummy.
02.05 Size and proportion photographs, line drawings, and other copy elements.
02.06 Copyfit and mark up (specify type sizes and styles).
02.07 Prepare computer typesetting equipment for operation.
02.08 Operate typesetting equipment.
02.09 Prepare typesetting processor.
02.10 Process typeset copy.
02.11 Proofread typeset output.
02.12 Paste up mechanical elements including keyline for photographs, tint blocks and ruling.
02.13 Prepare tissue overlay and specify color break, tint percentages and reverses.
02.14 Check and compare completed mechanical to comprehensive layouts for final proofing.
02.15 Prepare desk-top publishing equipment for operations.
02.16 Operate desk-top publishing equipment.
02.17 Proofread desk-top copy.
02.18 Modify existing copy utilizing desk-top publishing equipment.
02.19 Prepare multiple-page copy utilizing desk-top publishing equipment.

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each.
03.02 Apply basic principles of photosensitometry, orthochromatic, and panchromatic (including use of gray scale).
03.03 Apply basic principles of light pertaining to copy board illuminations and exposure calculations for all camera functions.
03.04 Apply basic principles of camera optics as pertains to exposure

control and focus, and camera extensions pertaining to reductions and enlargements.

03.05 Identify the parts of the process camera and explain their use.
03.06 Apply basic principles of darkroom chemistry.
03.07 Prepare darkroom chemistry.
03.08 Establish basic line exposure and exposure time at 100 percent using standard time and temperature development.
03.09 Apply basic principles of Kodak halftone computer and density guide.
03.10 Establish basic exposures to determine screen range, basic flash, main exposure, and bump exposure at 100 percent using standard time and temperature development.
03.11 Produce line negatives to size.
03.12 Inspect and compare line negatives to original mechanical.
03.13 Produce halftones to size.
03.14 Inspect and compare halftones to original copy.
03.15 Make line and halftone diffusion transfer prints.
03.16 Inspect and compare prints to original mechanical.
03.17 Apply basic principles of additive and subtractive color pertaining to the use of filters.
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development.
03.19 Identify the parts of a contact frame and point light source and explain their use.
03.20 Produce contacts using orthochromatic and duplicating film, transmission density guide and standard time and temperature development.
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each.
03.22 Apply basic principles of stripping using a T-square and triangle to align, position, and tape film (emulsion side up) on ruled or unruled plastic or paper masking sheets; open windows; and opaque on the emulsion side.
03.23 Strip 1-color, 1-up layouts.
03.24 Strip 1-color, multiple layouts.
03.25 Strip 1-color, step layouts
03.26 Strip 1-color, 4-page layouts
03.27 Strip 1-color, 8-page layouts
03.28 Strip multiple burn layout (halftone and screen tints).
03.29 Strip multiple flat color layout.
03.30 Inspect and compare flats to original mechanical.
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photosensitive additive or subtractive paper or metal plates.
03.32 Produce proofs on diazo or silver paper.
03.33 Process proofs.
03.34 Inspect and compare proofs to the original mechanical.
03.35 Produce additive or subtractive paper or metal plates.
03.36 Process plates.
03.37 Inspect and compare plates to proofs.
03.38 File, handle, and retrieve flats and plates.

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS--The student will be able to:

04.01 Identify the equipment and material used in offset press operations, their parts and functions, and the safety rules relating to their operation.
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle, and dryer).

04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous).
04.04 Apply basic principles of offset lithography pertaining to fountain solutions chemical components (acid, alkaline, and neutral).
04.05 Apply basic principles of offset lithography pertaining to ph-control and its effects on the lithographic process.
04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper (coated and uncoated and various grades within).
04.07 Apply basic principles of offset lithography pertaining to the inter-relationships of textured or smooth paper; paper, plastic, metal plates; and conventional or compressible blankets.
04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off; and problems associated with inappropriate use of spray powder).
04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum arabic and asphaltum).
04.10 Prepare press for operation by reviewing job-ticket specifications and then selecting appropriate press and materials.
04.11 Prepare press for operation based on interrelationships of lithographic process.
04.12 Mix fountain solution from concentrate.
04.13 Mix ink to PMS (Pantone Matching System) specifications
04.14 Introduce ink and fountain solution to press in proper sequence.
04.15 Set up and adjust feeder to paper specifications (air blast, vacuum, and choke).
04.16 Set up and adjust register system to single sheet or stream fed, side guide, and head register.
04.17 Set up and adjust delivery (chute or chain).
04.18 Mount blanket (pack if necessary) and adjust to press specifications.
04.19 Mount blanket (pack if necessary) and adjust to press specifications.
04.20 Set impression cylinder to paper thickness and press specifications.
04.21 Set and adjust ink and water rollers pressures to press specifications.
04.22 Make-ready press to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure, and sheet registration.
04.23 Inspect and evaluate final make-ready sheet to job-ticket specifications and obtain proof approval to run.
04.24 Set spray powder.
04.25 Produce required number of press sheets to job-ticket specifications.
04.26 Preserve plate for long-term storage.
04.27 Perform press wash-up.
04.28 Perform press maintenance to manufacturers' specifications.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS--The student will be able to:

05.01 Identify the equipment and materials used in finishing/binding operations, their parts and functions, and the safety rules relating to their operation.
05.02 Apply basic principles of finishing/binding operations pertaining to progress paper cutting, post press paper cutting and post bindery cutting (after folding, stitching, etc.
05.03 Apply basic principles of finishing/binding operations pertaining

to sheet cutting.

05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper, and finish (coated or uncoated) of paper.
05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations.
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding.
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating.
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering.
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc).
05.10 Apply basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart)
05.11 Apply basic principles of finishing/binding operations pertaining to packaging and identification.
05.12 Demonstrate methods of counting sheets(machine, measurement, weight, and rapid multiple-sheet manual counting by fives).
05.13 Hand-jog 8 12" x 11" sheets.
05.14 Hand-jog 17" x 22" and larger sheets.
05.15 Machine jog sheets
05.16 Prepare rule-out of press sheet for finishing operations according to job-ticket specifications and approved proof.
05.17 Set up and operate cutter in accordance with rule-out.
05.18 Prepare folding dummy from press sheet in accordance with job-ticket specifications and approved proof.
05.19 Set up and operate folder in accordance with job-ticket specifications and folding dummy.
05.20 Make a single fold.
05.21 Make a multiple parallel fold.
05.22 Make a right angle fold.
05.23 Identify and define slitting, perforating, and scoring functions pertaining to folding operations.
05.24 Define collating flat sheets.
05.25 Define gathering of signatures.
05.26 Set up and operate stitcher (side and saddle).
05.27 Set up and operate comb binding machine.
05.28 Perform paper padding functions.
05.29 Define perfect, spiral, and case binding.
05.30 Set up and operate a paper drill for standard looseleaf binder.
05.31 Define die-cutting, embossing, foil stamping, and numbering.
05.32 Package and identify completed job according to job-ticket specifications.

06.0 DEMONSTRATE THE ABILITY TO PERFORM SUPPORT OPERATIONS FOR LABORATORY PROJECTS:--The student will be able to:

06.01 Plan a production schedule for projects and estimate time for completion.
06.02 Schedule department functions according to production schedule.
06.03 Prepare a job cost estimate for each project based on established machine hourly rate.
06.04 Perform supervisory functions.
06.05 apply basic principles of hyphenation and justification to typesetting.
06.06 Prepare and produce columnar typeset copy of typesetter in manual mode, making line-ending decisions and comparing with typeset copy set in the automatic mode.
06.07 Explain reasons for making line-ending decisions when preparing and producing columnar typeset copy on typesetter in manual mode.

06.08 Set ruled from with headings.
06.09 Set a one-column run-a-round right.
06.10 Set a one-column run-a-round left.
06.11 Set kerned headlines.
06.12 Set letter spaced headlines.
06.13 Set a series of (existing student formatted) projects that output as camera ready art.
06.14 Proofread all typeset output projects and mark corrections with proofreaders' marks.
06.15 Paste up a complete mechanical following a folded, not bound imposition allowing for bleeds and trims; i.e. brochure or four-page layout.
06.16 Apply basic principles of paste-up following folded bound signature imposition and allow for lips, trims and bleeds according to saddle and side-stitch binding method.
06.17 Apply basic principles of paste-up following folded bound signature imposition and allow for lips, trims and bleeds according to perfect binding method.
06.18 Apply basic principles of paste-up following folded bound signature imposition and allow for lips, trims and bleeds according to spiral binding method.
06.19 Apply basic principles of paste-up following folded bound signature imposition and allow for lips, trims and bleeds according to comb binding method.
06.20 Apply basic principles of paste-up following folded bound signature imposition and allow for lips, trims and bleeds according to case binding method.
06.21 Explain differences in complexities of multiple signature impositions dependent on binding method used.
06.22 Proofread and mark up mechanical using proofreaders' marks on tissue overlay.
06.23 Perform supervisory functions.

07.0 DEMONSTRATE THE ABILITY TO PERFORM PRE-PRESS OPERATIONS FOR LABORATORY PROJECTS--The student will be able to:

07.01 Produce line negatives from substandard weak density copy using such alternatives as time and temperature variations, filters, filter variations and film reversal methods.
07.02 Produce line negatives from substandard colored copy using such alternatives as time and temperature variations, filters, filter variations and film reversal methods.
07.03 Produce line negatives from substandard reverse copy using such alternatives as time and temperature variations, filters, filter variations and film reversal methods.
07.04 Produce line negatives from substandard mechanicals using such alternatives as time and temperature variations, filters, filter variations and film reversal methods.
07.05 Produce halftone negatives using black and white photos with density ranges less than, equal to and much greater than the density range of the screen.
07.06 Predetermine results of producing halftone negatives from substandard copy by using the Kodak Graphic Arts Computer.
07.07 Predetermine tone value shifts needed to reproduce more lifelike results from substandard copy.
07.08 Apply basic principles of shooting fluorescent copy in line and halftone negatives.
07.09 Use visual inspection method of development to establish basic halftone exposure from a color photograph to establish highlight area.
07.10 Apply basic principles to obtain necessary tonal sifts based on evaluation of correct highlight halftone.

07.11 Produce spreads using contacting methods.
07.12 Produce chokes using contacting methods.
07.13 Produce screen tints using contacting methods.
07.14 Produce reverses using contacting methods.
07.15 Apply basic principles of stripping following folded bound signature imposition and allow for lips, trims and bleeds according to saddle and side-stitch binding method.
07.16 Apply basic principles of stripping following folded bound signature imposition and allow for lips, trims and bleeds according to perfect binding method.
07.17 Apply basic principles of stripping following folded bound signature imposition and allow for lips, trims and bleeds according to spiral binding method.
07.18 Apply basic principles of stripping following folded bound signature imposition and allow for lips, trims and bleeds according to comb binding method.
07.19 Apply basic principles of stripping following folded bound signature imposition and allow for lips, trims and bleeds according to case binding method.
07.20 Explain the difference in complexities of multiple signature impositions dependent on the binding method.
07.21 Produce tint blocks using rubylith.
07.22 Produce silhouettes using rubylith.
07.23 Produce reverses using rubylith.
07.24 Produce halftone windows using rubylith.
07.25 Predetermine screen values and standard screen angles from color wheel or Graphic Arts Technical Foundation (GATF) color communicator.
07.26 Produce multicolor flats to reproduce various colors by use of overprinting screen tints utilizing a pin register system.
07.27 Perform supervisory functions.

08.0 DEMONSTRATE THE ABILITY TO PERFORM OFFSET PRESS OPERATIONS FOR LABORATORY PROJECTS--The student will be able to:

08.01 Apply basic principles of offset press operations with regard to work and turn, work and tumble and sheet wise printed products.
08.02 Produce a tight register one-color project.
08.03 Product a tight register one- or two-color, precollated carbonless project.
08.04 Produce a two-color tight register project.
08.05 Produce a one- or two-color tight register envelope project.
08.06 Produce a tight register one-color metallic ink project.
08.07 Produce a tight register one- or two-color folding two-sided project.
08.08 Produce a multicolor tight register project.
08.09 Perform supervisory functions.

09.0 DEMONSTRATE THE ABILITY TO PERFORM FINISHING/BINDING OPERATIONS FOR LABORATORY PROJECTS--The student will be able to:

09.01 Apply basic principles of finishing and binding following folded bound signature impositions to allow for lips, trims and bleeds according to saddle- and side-stitch binding method.
09.02 Apply basic principles of finishing and binding following folded bound signature impositions and allow for lips, trims and bleeds according to perfect binding method.
09.03 Apply basic principles of finishing and binding following folded bound signature impositions and allow for lips, trims and bleeds according to spiral binding method.
09.04 Apply basic principles of finishing and binding following folded bound signature impositions and allow for lips, trims and bleeds

according to comb binding method.

09.05 Apply basic principles of finishing and binding following folded bound signature impositions and allow for lips, trims and bleeds according to case binding method.

09.06 Explain the difference in complexities of multiple signature impositions dependent on binding method.

09.07 Perform supervisory functions.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.

0.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.

10.03 Read and follow written and oral instructions.

10.04 Answer and ask questions coherently and concisely.

10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.

10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.

11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.

11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

12.02 Draw conclusions or make inferences from data.

12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.

13.02 Secure information about a job.

13.03 Identify documents that may be required when applying for a job.

13.04 Complete a job application form correctly.

13.05 Demonstrate competence in job interview techniques.

13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.

13.07 Identify acceptable work habits.

13.08 Demonstrate knowledge of how to make job changes appropriately.

13.09 Demonstrate acceptable employee health habits.

13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Professional Pilot Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0649.010200

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

_x_Postsecondary Vocational ___Other_________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as aircraft pilot, flight engineer (97702910), airplane pilot, commercial (196.263-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Administration pilot certification procedures, aircraft systems and components, flight safety, applied physics and aerodynamics, and instrumentation.

II. LABORATORY ACTIVITIES: Classroom and laboratory activities are an integral part of this program and provide instruction in preflight preparation, primary flight, instrument and flight maneuvering, and commercial pilot preparation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of safe and efficient work practices.
02. Demonstrate an understanding of fundamentals of aeronautics.
03. Understand and explain Federal Aviation Administration pilot certification procedures.
04. Demonstrate understanding of meteorology.

05. Demonstrate knowledge of aircraft communication equipment.
06. Demonstrate knowledge and an understanding of aircraft engine systems.
07. Solve navigation problems.
08. Demonstrate understanding of Federal Aviation Administration flight rules and regulations.
09. Demonstrate proficiency in instrument assisted flight.
10. Interpret Federal Aviation Administration en route and terminal flight charts.
11. Demonstrate knowledge of aircraft weight and balance computations.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Professional Pilot Technology POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE AN UNDERSTANDING OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of ecological problems and know the solutions unique to the industry.
01.02 Demonstrate an awareness and understanding of fueling hazards.
01.03 Demonstrate an awareness and understanding of physical hazards.
01.04 Demonstrate an awareness and understanding of fire hazards.
01.05 Demonstrate an awareness of and the ability to control and extinguish fires.
01.06 Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.
01.07 Demonstrate awareness, understanding and use of personal safety devices such as goggles, masks, helmets, hearing protectors, air respirators and protective clothing.

02.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

02.01 Differentiate between aeronautics and aerodynamics.
02.02 State and give examples of Newton's three laws of motion.
02.03 Name and compare the four forces of flight.
02.04 Describe an airfoil.
02.05 Tell how lift is produced.
02.06 Discuss how and why an airplane stalls.
02.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
02.08 Explain the magnetic compass.

03.0 UNDERSTAND AND EXPLAIN FEDERAL AVIATION ADMINISTRATION PILOT CERTIFICATION PROCEDURES--The student will be able to:

03.01 Explain major portion of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.

04.0 DEMONSTRATE UNDERSTANDING OF METEOROLOGY--The student will be able to:

04.01 State the correct names of the major civilian and military weather organizations.
04.02 Name and tell the function of at least three instruments meteorologists use in gathering weather data.
04.03 Name and give a general description of two types of weather satellites.
04.04 Interpret weather surface charts, station sequence reports, terminal reports and area forecasts.

05.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT COMMUNICATION EQUIPMENT--The student will be able to:

05.01 Use and explain function of VHF radios.
05.02 Use and explain function of UHF radios.
05.03 Explain function and frequencies of ELT's.
05.04 Use proper phraseology in using radios.
05.05 Discuss uses and limitations of portable transceivers.

06.0 DEMONSTRATE KNOWLEDGE AND AN UNDERSTANDING OF AIRCRAFT ENGINE SYSTEMS--The student will be able to:

06.01 Describe and identify reciprocating and turbine engine components.
06.02 Compute displacement, compression ration, volumetric efficiency and I.H.P. problems.
06.03 Describe and sketch a basic float type carburetor.
06.04 Describe the advantages of a fuel injected engine.
06.05 Describe a typical lubrication system on an opposed engine.
06.06 Describe a typical magneto ignition system including proper magneto checks.
06.07 Describe the difference between a normally aspirated engine and one that is supercharged.
06.08 Demonstrate basic operation of an aircraft engine including proper interpretation of instruments and operation of throttle, mixture control, carburetor heat control and prop control.

07.0 SOLVE NAVIGATION PROBLEMS--The student will be able to:

07.01 Define radio navigation.
07.02 Explain the magnetic compass.
07.03 Explain VOR navigation
07.04 Explain the ADF.
07.05 Explain DME and RNAV principles.
07.06 Demonstrate usage of magnetic coordinates.
07.07 Demonstrate and explain the flight computer.
07.08 Explain sectional charts and their use.
07.09 Explain en route and terminal charts.
07.10 Explain lost communications emergency procedures VFR and IFR.
07.11 Read and interpret aircraft performance charts.
07.12 Plot and explain a cross country course.

08.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AVIATION ADMINISTRATION FLIGHT RULES AND REGULATIONS--The student will be able to:

08.01 Explain major portions of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Rules and Regulations.

09.0 DEMONSTRATE PROFICIENCY IN INSTRUMENT ASSISTED FLIGHT--The student will be able to:

09.01 Define Instrument Flight Rules.
09.02 Demonstrate proper usage of radio communications.
09.03 Demonstrate proper use of navigation equipment.
09.04 Explain how IFR flight differs from VFR.
09.05 Demonstrate proper navigation by instruments using a flight simulator.

10.0 INTERPRET FEDERAL AVIATION ADMINISTRATION EN ROUTE AND TERMINAL FLIGHT CHARTS--The student will be able to:

10.01 Explain enroute and terminal chart legends.
10.02 Demonstrate and explain an enroute chart.
10.03 Demonstrate and explain a terminal chart.
10.04 Explain an approach plate.
10.05 Define SID's and STAR's.

11.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT WEIGHT AND BALANCE COMPUTATIONS--The student will be able to:

11.01 Define weight and balance.
11.02 Define center of gravity, moment, datum line, CG envelope, basic

empty weight and gross weight.
11.03 Use calculator and performance charts.
11.04 Solve given weight and balance problems.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Quality Control and Reliability Technology

CODE NUMBER: Secondary ______ Postsecondary

Florida CIP 0615.070200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational ______ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as quality control inspectors (83002713), quality control technicians (012.261-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of equipment and tools, mathematics, work planning and layout, manufacturing processes, welding, machining and metal fabrication and methods of evaluating manufactured products.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of inspection tools, sketching, manufacturing control processes, layout and sampling, and testing processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the

student will be able to:

01. Demonstrate appropriate shop safety.
02. Explain quality control concepts.
03. Use and maintain tools and equipment.
04. Perform mathematical calculations.
05. Read and interpret blueprints.
06. Lay out work.
07. Explain basic machining terms and operations.
08. Develop sketches from oral descriptions and/or written information.
09. Define or explain basic welding terms and concepts.
10. Evaluate welds and identify metals.
11. Identify and describe welding processes.
12. Explain metal fabrication process.
13. Explain machining fabrication process.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Quality Control and Reliability Technology POSTSECONDARY NUMBER:

01.0 DEMONSTRATE APPROPRIATE SHOP SAFETY--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention, correction and ecological problems and solution unique to quality control and reliability processes and systems.
01.02 Demonstrate an understanding of physical hazards.
01.03 Demonstrate an understanding of chemical hazards.
01.04 Demonstrate an understanding of biological and biomechanical hazards.
01.05 Demonstrate an awareness and understanding of fire hazards in manufacture, processing, and fabrication.
01.06 Demonstrate an understanding and procedures to control and extinguish NFPA classes of fire.
01.07 Demonstrate an awareness and understanding for the need and use of safety devices, controls, guards and equipment.
01.08 Demonstrate awareness, understanding and use of personal safety protection and devices including but not limited to goggles, safety glasses, masks, helmets, hearing protectors, air respirators, protective clothing, safety shoes and mesh gloves.
01.09 Demonstrate administration of first air procedures and accident procedures.
01.10 Demonstrate an understanding of the laws and agencies which regulate and establish safety standards including: National Safety Council (NSC), Occupational Safety and Health Administration (OSHA), National Institute of Occupational Safety and Health (NIOSH), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Mining Enforcement and Safety Administration (MESA), Power Tool Institute (PI), Hand Tool Institute (HTI), U. S. Consumer Products Safety Commission (CPSC), American Society of Mechanical Engineers (ASME), American Society of Agricultural Engineers (ASAF), American Society for Testing and Materials (ASTM).
01.11 Demonstrate safe use of chemicals and solvents.
01.12 Demonstrate safe use of measuring tools and hand tools.
01.13 Demonstrate safe use of portable power tools.
01.14 Demonstrate safe use of powered equipment.
01.15 Demonstrate safe storage of materials, tools, equipment and personal safety equipment.
01.16 Demonstrate disposing of waste materials.
01.17 Demonstrate safe housekeeping practices at work stations.
01.18 Demonstrate safe practices for lifting, moving and handling materials and equipment.
01.19 Demonstrate an understanding of Workers Compensation Law, workers liability and responsibilities at a work site.

02.0 EXPLAIN QUALITY CONTROL CONCEPTS--The student will be able to:

02.01 Demonstrate an understanding of the relationships between human motivation, product production, product quality, product production costs, moral and plan efficiency.
02.02 Demonstrate an understanding of the inspection processes, requirements and systems.

02.03 Demonstrate an understanding of the purposes of quality control.
02.04 Demonstrate an understanding of in-process inspection and methods to perform in-process inspections.
02.05 Demonstrate an understanding of workers' and inspectors' roles and responsibilities to ensure quality.
02.06 Demonstrate an understanding of trial run and production run.
02.07 Demonstrate an understanding of processes and techniques to ensure reliability of products.

03.0 USE AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

03.01 Identify safe and unsafe hand tools.
03.02 Demonstrate ability to maintain safe tools.
03.03 Demonstrate ability to use hand tools safely.
03.04 Identify safe and unsafe testing equipment.
03.05 Demonstrate procedures to follow when unsafe testing equipment is to be used on-line.
03.06 Demonstrate safe use of testing equipment used for tensile-compression testing, bending testing, impact testing, fatigue testing, shear testing, hardness testing, liquid-penetrant testing, radiographic testing, ultrasonic testing, magnetic-analysis testing, electrical-analysis testing, X-ray and Gamma ray testing.
03.07 Demonstrate an understanding of safety considerations workers must apply when using tools and equipment.
03.08 Demonstrate proper use of safety equipment and personal safety devices relative to the tools and equipment to be used.
03.09 Demonstrate ability to clean, adjust, calibrate and set up testing equipment for safe use.
03.10 Demonstrate ability to select proper tools and equipment for materials and products to be tested or inspected.

04.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

04.01 Demonstrate the ability to apply arithmetic.
04.02 Demonstrate the ability to apply basic algebra and applied algebra, including foundations of geometry.
04.03 Demonstrate the ability to apply trigonometry.
04.04 Demonstrate the ability to use standard and metric measurements and notes.
04.05 Demonstrate practical applications of mathematics.

05.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

05.01 Use working drawings which include detail and assembly drawings.
05.02 Use and interpret information on exterior view, sectional view, auxiliary views, balloon drawings, exploded views, perspective drawings, line diagrams, charts, graphs, pert charts, CAD/CAM and CAMM programs.
05.03 Describe, identify and use symbols and abbreviations.
05.04 Use and interpret field notes, technical manual information, bulletins and specifications.
05.05 Modify and perform field changes to original information from written or verbal instructions.
05.06 Read/convert and use English and metric measurements.
05.07 Use English and metric measuring tools, scales and instruments.
05.08 Use English and metric conversion and reference charts, tables and graphs.

06.0 LAY OUT WORK--The student will be able to:

06.01 Use drawings, blueprints, specifications and other required information to plan a proper sequence to determine the quality of a product and test its reliability.

06.02 Select appropriate methods, tools and equipment to perform quality and reliability tests.

06.03 Prepare a written procedure for a particular product quality and reliability tests.

06.04 Prepare a written inspection procedure for production lines.

06.05 Prepare a product evaluation procedure incorporating quality and reliability testing, production line trial run information and prototype expectations.

06.06 Prepare final documentation for approval and acceptance for product production runs.

07.0 EXPLAIN BASIC MACHINING TERMS AND OPERATIONS--The student will be able to:

07.01 Identify the parts of and explain the differences between: engine lathe, speed lathe, toolroom lathe, tracer lathes, turret lathe, automatic chucking lathe and automatic screw machine.

07.02 Identify the parts of and explain the differences between milling machines, including: column-knee, fixed bed, planer type, duplicating mills, hobbing machine.

07.03 Identify the parts of and explain the differences between drilling machines, including: upright drilling machines, radial drilling machines, multiple-spindle drilling machines, gang drilling machines, two-way horizontal multiple-spindle drilling machines, deep-hole drilling machine and jig boring machine.

07.04 Identify the parts of and explain the differences between saws, including: reciprocating saws, band saws and circular saws.

07.05 Identify the parts of and explain the differences between grinding machines, including: surface grinders, cylindrical grinders and special grinding machines.

07.06 Identify the parts of and explain the differences between grinders, including: lapping, honing, drum and blasting.

07.07 List and define operations which machines in the following categories can perform: lathes, shapers, planers, broaches, mills, drills, saws and grinders.

08.0 DEVELOP SKETCHES FROM ORAL DESCRIPTIONS AND/OR WRITTEN INFORMATION--The student will be able to:

08.01 Translate verbal instruction into working notes.
08.02 Translate working notes into legible sketches.
08.03 Demonstrate use of appropriate symbols and abbreviations.
08.04 Demonstrate proper use of scales, triangles and graph papers.
08.05 Demonstrate use of symbols templates.
08.06 Demonstrate proper placement of appropriate production or change notations on sketches.

09.0 DEFINE OR EXPLAIN BASIC WELDING TERMS AND CONCEPTS--The student will be able to:

09.01 List welding terms and trade technology associated with the five major categories of welding which are: solid state, brazing, gas welding, resistance welding, arc welding and other processes.

09.02 Define trade terms and abbreviations commonly found in welding manual glossary.

09.03 List and define comparative difference between the five major welding methods.

10.0 EVALUATE WELDS AND IDENTIFY METALS--The student will be able to:

10.01 Evaluate the quality of welds by utilizing the following methods of testing welds: fracture test, tensile test, bend test, metallographic test, visual inspection, magnetic particle inspection, liquid penetrant tests, ultrasonic tests, radiographic test.
10.02 Identify the following types of weld defects: cracks, porosity, cold shut, inclusions, lack of fusion, and undercut.
10.03 Identify common metals visual test (form, weight, color, shape).
10.04 Identify metals using the following processes: spark test, chip test, melting temperature, magnet test and weight test.

11.0 IDENTIFY AND DESCRIBE WELDING PROCESSES--The student will be able to:

11.01 Identify, list and describe the following welding processes: carbon arc welding, shielded metal arc welding, flux cored arc welding, gas metal arc welding, gas tungsten arc welding, submerged arc welding, plasma arc welding, stud welding, percussion welding, upset welding, flash welding, projection welding, resistance seam welding, resistance spot welding, pressure gas welding, oxy-hydrogen welding, oxy-acetylene welding, dip brazing, resistance brazing, induction brazing, furnace brazing, torch brazing, infra-red brazing, cold welding, diffusion welding, explosion welding, forge welding, friction welding, ultrasonic welding, electron beam welding, electro-slag welding, induction welding, laser beam welding and thermit welding.
11.02 List and describe equipment, supplies and tools necessary to perform the processes listed above.

12.0 EXPLAIN METAL FABRICATION PROCESSES--The student will be able to:

12.01 List and describe procedures for preparing metal for fabrication.
12.02 List and describe processes for mechanically attaching metal together (light gauge and heavy gauge).
12.03 List and describe processes for physically bonding metal together.

13.0 EXPLAIN MACHINING FABRICATION PROCESSES--The student will be able to:

13.01 List and explain the processes and machines necessary to accomplish the following fabrication requirements: cutting, shaping, forming, turning, drilling, finishing, pressing, drawing, bending, shearing, slitting, rolling, forging, swaging, hobbing, coining, surfacing, extruding, braking, notching, nibbling, piercing, blanking, trimming, perforating, trueing, shaving.
13.02 List and explain the measuring tools, hand tools, machines and materials necessary to perform each of the fabrication processes listed above.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student

will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Radio and Television Broadcast Programming

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0610.010402

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational ______ Other _________ ___

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare the student for employment as a broadcast director. The content includes but is not limited to: commercial or industrial TV and radio/studio assisting, camera operating, technical directing, producing video tape or film chain operating, audio controlling, gaffing, grip, or script writing.

II. LABORATORY ACTIVITIES: Laboratory activities include the preparation and execution of both radio and TV production in the studio and in the field (ENG and EFP). Activity includes writing, story-boarding, setting up, rehearsing, and production. In addition, the student may take a three credit internship and work in a local TV or Radio station, or an audio or video production house.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

Sixty-five credits are recommended for the A.S. Degree. Thirty-two credits should be taken in the major area.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of the television production technology program instructional system, safety procedures and trade terminology.
02. Plan a set for television production.
03. Perform lighting activities for a planned production.
04. Operate studio color television camera.
05. Perform video tape recording and editing operations.

06. Perform television production and programming activities.
07. Perform character generator and special effects generator functions.
08. Operate television studio audio control system.
09. Perform electronic news gathering (ENG) and electronic field production (EFP) equipment functions.
10. Perform basic film operations.
11. Perform routine operator preventative maintenance operations.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science.
15. Demonstrate employability skills.
16. Demonstrate appropriate broadcast speaking manner.
17. Operate control room equipment.
18. Demonstrate radio broadcasting skills.
19. Explain and demonstrate news broadcasting.
20. Write broadcast news.
21. Explain and demonstrate ability to properly control radio traffic.
22. Write commercial copy.
23. Explain programming concepts.
24. Describe business aspects of broadcasting.
25. Explain surveys and demographics.
26. Explain rules and regulations governing radio broadcasts.
27. Perform radio broadcasting functions.
28. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Radio and Television Broadcast Programming

01.0 DEMONSTRATE KNOWLEDGE OF THE TELEVISION PRODUCTION TECHNOLOGY PROGRAM INSTRUCTIONAL SYSTEM, SAFETY PROCEDURES AND TRADE TERMINOLOGY--The student will be able to:

01.01 Describe the operating system of the vocational program.
01.02 State and apply general safety rules for operation of equipment and learning activities in the lab.
01.03 Utilize trade terminology in the television production lab.
01.04 Utilize trade abbreviations and acronyms as appropriate.
01.05 Transport equipment safely and securely.
01.06 Store equipment in appropriate locations.

02.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

02.01 Prepare television set for a planned production.
02.02 Draw and design a set plan to scale.
02.03 Select and arrange stage props.
02.04 Utilize hand tools to construct scene components.
02.05 Inspect and repair scenery as needed.

03.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

03.01 Describe types of lighting fixtures.
03.02 Identify parts of lighting fixtures.
03.03 Perform special-effects lighting.
03.04 Set-up appropriate lighting for a production.
03.05 Describe functions of master lighting panel and dimmer board.
03.06 Operate master lighting panel to dimmer board.
03.07 Analyze lighting needs for production.
03.08 Describe dangers of high intensity studio lighting.
03.09 Understand lighting theory.

04.0 OPERATE STUDIO COLOR TELEVISION CAMERA--The student will be able to:

04.01 Describe major parts of a studio camera.
04.02 Align camera for a studio production.
04.03 Perform appropriate camera movements.
04.04 Operate camera for commercial recording.
04.05 Operate camera for studio production.
04.06 Perform floor director's functions.
04.07 Understand CCU Camera Control Unit.

05.0 PERFORM VIDEO TAPE RECORDING AND EDITING OPERATIONS--The student will be able to:

05.01 Identify and describe different video tape machines.
05.02 Describe operational parts of a video tape machine.
05.03 Operate video tape machine to record and playback.
05.04 Describe operational parts of a video cassette editor.
05.05 Perform assemble edits.
05.06 Perform insert edits.
05.07 Set up video tape machines.
05.08 Set up video cassette editor.
05.09 Recognize different video tape formats.

06.0 PERFORM TELEVISION PRODUCTION AND PROGRAMMING ACTIVITIES--The student will be able:

06.01 Operate master switcher.
06.02 Operate routing switcher for production and tape dubs.
06.03 Set up machines and tuner for in-house playback.
06.04 Develop script for a program.
06.05 Draw story board for a planned production.
06.06 Direct participants in production of a program.
06.07 Perform on-camera.
06.08 Act as producer to get program from idea to air.
06.09 Operate through the lens teleprompter.

07.0 PERFORM CHARACTER GENERATOR AND SPECIAL EFFECTS GENERATOR FUNCTIONS--The student will be able to:

07.01 Describe operational parts of character generator.
07.02 Set up character generator.
07.03 Describe inputs of special effects generator.
07.04 Operate special effects generator during production.
07.05 Operate character generator during production.
07.06 Demonstrate basic computer literacy.
07.07 Demonstrate knowledge of computer generated video graphics.

08.0 OPERATE TELEVISION STUDIO AUDIO CONTROL SYSTEM--The student will be able to:

08.01 Identify and select microphones for production.
08.02 Place microphones for maximum effect.
08.03 Describe parts of cartridge machine.
08.04 Set up cartridge machine for production.
08.05 Operate cartridge machine during recording and playback.
08.06 Describe parts of reel-to-reel tape machine.
08.07 Set up reel-to-reel tape and cassette tape machines for production.
08.08 Operate reel-to-reel tape and cassette tape machines for production.
08.09 Describe parts of a turntable.
08.10 Operate turntable for production.
08.11 Describe parts of audio mixing console.
08.12 Operate audio mixing console.
08.13 Operate cassette with search for production.
08.14 Operate compact disc sound source during production.

09.0 PERFORM ELECTRONIC NEWS GATHERING (ENG) AND ELECTRONIC FIELD PRODUCTION(EFP) EQUIPMENT FUNCTIONS--The student will be able to:

09.01 Describe ENG and EFP port-a-pac components.
09.02 Set up port-a-pac for field production.
09.03 Operate port-a-pac during production segments.
09.04 Complete a field production from writing to shooting to VCR electronic editing.

10.0 PERFORM BASIC FILM OPERATIONS--The student will be able to:

10.01 Operate film editor.
10.02 Edit film for time slot.
10.03 Describe parts of film island.
10.04 Set-up film island for production.
10.05 Demonstrate skill in both cut and paste editing and transfer to tape electronic editing.

11.0 PERFORM ROUTINE OPERATOR PREVENTATIVE MAINTENANCE OPERATIONS--The

student will be able to:

11.01 Describe types of video connectors.
11.02 Describe types of audio connectors.
11.03 Assemble audio and video cables.
11.04 Clean tape heads on audio recording equipment.
11.05 Clean tape heads on video recording equipment.
11.06 Replace broken knobs.
11.07 Replace sliders and potentiometers.
11.08 Replace headshell/cartridge and balance tone arm.
11.09 Replace bulb in light fixture.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.

15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Prepare a resume.
15.11 Prepare an audio audition tape (required).
15.12 Prepare a video audition tape (optional).
15.13 Write a letter of introduction.
15.14 Demonstrate a knowledge of Radio/TV career patterns.
15.15 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE APPROPRIATE BROADCAST SPEAKING MANNER--The student will be able to:

16.01 Identify and correct his own vocal deficiencies.
16.02 Demonstrate his ability to breathe properly, project and control loudness, resonate his voice and vary tone, pitch and pace.
16.03 Articulate and pronounce words according to accepted standards.
16.04 Understand the basic elements of good speech.
16.05 Express feelings with voice.
16.06 Interpret copy for dramatic content.

17.0 OPERATE CONTROL ROOM EQUIPMENT--The student will be able to:

17.01 Demonstrate a working familiarity and understanding of the functions of an audio console (mixer).
17.02 State the characteristics of various microphone types and demonstrate the ability to use them.
17.03 Demonstrate knowledge of and ability to operate turntables, tape recorders, cart recorders and playbacks.
17.04 Handle remote sources through the console.
17.05 Demonstrate how to handle an audio portion of a deejay show and news program, putting together all the elements of audio control in radio.
17.06 Demonstrate ability to work as an audio control operator in TV or radio studio production.
17.07 Understand the ad-lib format and show proficiency in that style of broadcast.

18.0 DEMONSTRATE RADIO BROADCASTING SKILLS--The student will be able to:

18.01 Outline the qualifications and requirements of a radio announcer.
18.02 Demonstrate development of the skills of announcing, the various techniques of delivery and procedures according to accepted standards.
18.03 Demonstrate the ability to perform to standards before a TV camera, visually and orally.
18.04 Perform the various assignments in a professional manner, for both radio and TV, according to industry standards.

19.0 EXPLAIN AND DEMONSTRATE NEWS BROADCASTING--The student will be able to:

19.01 Differentiate between news, commentary, and editorials.
19.02 Demonstrate ability to mark, edit, and present news in an acceptable manner.
19.03 Demonstrate ability to use the various equipment of a newsroom.
19.04 Identify the various sources of news and how they are used.
19.05 Demonstrate ability to ad-lib from the scene, interview guests, and type news stories.
19.06 Understand and interpret criticism of broadcast news.

20.0 WRITE BROADCAST NEWS--The student will be able to:

20.01 List the elements that constitute news materials and evaluate them.
20.02 Demonstrate ability to write news stories in broadcast style.
20.03 Be able to use the broadcast style page format.
20.04 Understand the technique of using present of past perfect tense in writing broadcast news.

21.0 EXPLAIN AND DEMONSTRATE ABILITY TO PROPERLY CONTROL RADIO TRAFFIC--The student will be able to:

21.01 State the duties of the traffic department.
21.02 List the elements and procedures of log-keeping.
21.03 Demonstrate a working knowledge of the rules and regulations pertaining to traffic control and standards of performance.
21.04 Demonstrate the ability to create a program log.

22.0 WRITE COMMERCIAL COPY--The student will be able to:

22.01 Explain the job of a copy writer and outline the elements of good copy.
22.02 Demonstrate ability to write commercial continuity in its various forms.
22.03 Demonstrate ability to select and utilize music and sound effects in the production of recorded copy.
22.04 Demonstrate ability to edit, splice, dub, overlap sound or otherwise utilize various production techniques.

23.0 EXPLAIN PROGRAMMING CONCEPTS--The student will be able to:

23.01 List and explain the various functions under the control of the program director.
23.02 Differentiate between formats used in large and small markets.
23.03 Explain various methods of station promotion, including procedures and rules.
23.04 Explain the techniques and procedures of networks, syndication, news, talk, sports, special events, public service and music programs.
23.05 Identify the various music formats used in contemporary radio.
23.06 Understand FCC rules dealing with indecent programming and obscenity.

24.0 EXPLAIN BUSINESS ASPECTS OF BROADCASTING--The student will be able to:

24.01 Explain the determination of cost and expense involved in station operation, the financial structure, the evaluation of time to the station and its clients.
24.02 List procedures and techniques of radio sales and demonstrate the ability to use maps, rate cards, contracts, etc., in accordance with station practice.
24.03 Explain the requirements and regulations of station ownership.
24.04 Describe the development of media advertising and explain the various forms utilized in the industry today.

25.0 EXPLAIN SURVEYS AND DEMOGRAPHICS--The student will be able to:

25.01 Explain the methods of measurement used by broadcasters and evaluate their function in the overall operation of a station.
25.02 Outline the methodology of pulse, ARB, and explain the use of the SRDS.

26.0 EXPLAIN RULES AND REGULATIONS GOVERNING RADIO BROADCASTS--The student will be able:

26.01 Demonstrate an understanding of rules and regulations governing licenses, measurement and records, political broadcasts, and lottery laws.
26.02 Will show an understanding of the features in BROADCASTING magazine including the update on all Broadcasting litigation and lawmaking.

27.0 PERFORM RADIO BROADCASTING FUNCTIONS--The student will be able to:

27.01 Perform to high standards in the role of audio operator, announcer, deejay, newsman, interviewer and commercial production, in varied format situations.

28.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

28.01 Define entrepreneurship.
28.02 Describe the importance of entrepreneurship to the American economy.
28.03 List the advantages and disadvantages of business ownership.
28.04 Identify the risk involved in owning a business.
28.05 Identify the personal characteristics of a successful entrepreneur.
28.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Radio Broadcasting

CODE NUMBER: Secondary ______ Postsecondary I100114

Florida CIP 0610.010401

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: TEC ELEC @ 7 G TV PRO TEC @ 7 G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for initial employment with occupational titles as radio and television announcer (34017192), radio announcer (159.147-010), broadcast technicians (249.387-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, announcing and moderating programs, preparing copy, programming, and operation of audio broadcasting equipment to support broadcast managers in the production of materials and production and broadcasting of materials or programs in radio format.

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in a wide variety of radio station positions to enhance the students' employability and versatility upon completion of the program. Lab activities include operation of equipment, copy writing spots, weather, news, sound effects, taping, editing, transfers, and voice and speech control.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

A Federal Communications Commission radio telephone third class license is required for employment in most positions in radio stations. Appropriate preparation for the exam is a part of the content of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 750 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of procedures.
02. Demonstrate appropriate broadcast speaking manner.
03. Operate control room equipment.
04. Demonstrate radio broadcasting skills.
05. Explain and demonstrate news broadcasting.
06. Write broadcast news.
07. Explain and demonstrate ability to properly control radio traffic.
08. Write commercial copy.
09. Explain programming concepts.
10. Describe business aspects of broadcasting.
11. Explain surveys and demographics.
12. Explain rules and regulations governing radio broadcasts.
13. Perform radio broadcasting functions.
14. Demonstrate competencies required for Federal Communications Commission radio telephone third class license.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Radio Broadcasting POSTSECONDARY NUMBER: I100114

01.0 DEMONSTRATE KNOWLEDGE OF PROCEDURES--The student will be able to:

01.01 Verbalize the rules and procedures of school and class.
01.02 Explain the structure of the broadcast industry, the radio station, and student role in the station's operation.
01.03 State the nature of the instruction, identify what will be learned in relation to stated goals and job opportunities that exist.

02.0 DEMONSTRATE APPROPRIATE BROADCAST SPEAKING MANNER--The student will be able to:

02.01 Identify and correct vocal deficiencies.
02.02 Demonstrate ability to breathe properly, project and control loudness, resonate the voice and vary tone, pitch and pace.
02.03 Articulate and pronounce words according to accepted standards.
02.04 Read aloud in a professional manner.

03.0 OPERATE CONTROL ROOM EQUIPMENT--The student will be able to:

03.01 Demonstrate a working familiarity and understanding of the functions of a control console.
03.02 State the characteristics of various microphones and demonstrate the ability to use them.
03.03 Demonstrate knowledge of and ability to operate turntables, tape recorders, cart recorders and playbacks.
03.04 Handle outside organizations through the console.
03.05 Demonstrate how to handle the audio portion of a deejay show and news program, putting together all the elements of audio control in radio.
03.06 Demonstrate ability to work as an audio control operator in TV studio production.

04.0 DEMONSTRATE RADIO BROADCASTING SKILLS--The student will be able to:

04.01 Outline the qualifications and requirements of a radio announcer.
04.02 Demonstrate development of the skills of announcing, the various techniques of delivery and procedures according to accepted standards.
04.03 Demonstrate the ability to perform to standards before a TV camera, visually and orally.
04.04 Perform the various assignments in a professional manner, for both radio and TV, according to industry standards.

05.0 EXPLAIN AND DEMONSTRATE NEWS BROADCASTING--The student will be able to:

05.01 Differentiate between news, commentary, and editorials.

05.02 Demonstrate ability to mark, edit, and present news in an acceptable manner.
05.03 Demonstrate ability to use the various equipment of a newsroom.
05.04 Explain the various sources of news and how they are used.
05.05 Demonstrate ability to ad-lib from the scene, interview guests, and type news stories.

06.0 WRITE BROADCAST NEWS--The student will be able to:

06.01 List the elements that constitute news materials and evaluate them.
06.02 Demonstrate ability to write news stories in broadcast style.

07.0 EXPLAIN AND DEMONSTRATE ABILITY TO PROPERLY CONTROL RADIO TRAFFIC--The student will be able to:

07.01 State the duties of the traffic department.
07.02 List the elements and procedures of log-keeping.
07.03 Demonstrate a working knowledge of the rules and regulations pertaining to traffic control and standards of performance.

08.0 WRITE COMMERCIAL COPY--The student will be able to:

08.01 Explain the job of a copy writer and outline the elements of good copy.
08.02 Demonstrate ability to write commercial continuity in it various forms.
08.03 Demonstrate ability to select and utilize music and sound effects in the production of recorded copy.
08.04 Demonstrate ability to edit, splice, dub, overlap sound or otherwise utilize various production techniques.

09.0 EXPLAIN PROGRAMMING CONCEPTS--The student will be able to:

09.01 List and explain the various functions under the control of the program director.
09.02 Differentiate between formats used in large and small markets.
09.03 Explain various methods of station promotion, types of contests including procedures and rules.
09.04 Explain the techniques and procedures of networks, syndication, news, talk, sports, special events, public service and music programs.

10.0 EXPLAIN BUSINESS ASPECTS OF BROADCASTING--The student will be able to:

10.01 Explain the determination of cost and expense involved in station operation, the financial structure, the evaluation of time to the station and its clients.
10.02 List procedures and techniques of radio sales and demonstrate the ability to use maps, rate cards, contracts, etc., in accordance with station practice.
10.03 Explain the requirements and regulations of station ownership.
10.04 Describe the development of media advertising and explain the various forms utilized in the industry today.

11.0 EXPLAIN SURVEYS AND DEMOGRAPHICS--The student will be able to:

11.01 Explain the methods of measurement used by broadcasters and evaluate their function in the overall operation of a station.
11.02 Outline the methodology of pulse, ARB, and explain the use of the SRDS.

12.0 EXPLAIN RULES AND REGULATIONS GOVERNING RADIO BROADCASTS--The student will be able to:

12.01 Demonstrate an understanding of the rules and regulations governing licenses, measurement and records, political broadcasts, and lottery laws.

13.0 PERFORM RADIO BROADCASTING FUNCTIONS--The student will be able to:

13.01 Perform to high standards in the role of audio operator, announcer, deejay, newsman, interviewer and production man, in varied format situations.

14.0 DEMONSTRATE COMPETENCIES REQUIRED FOR FEDERAL COMMUNICATIONS COMMISSION RADIO-TELEPHONE THIRD CLASS LICENSE--The student will be able to:

14.01 Pass the examination (F. C. C.) for Radio-Telephone Operator's License (Third) with broadcast endorsement.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as

recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Recreational Vehicle Service Technician

CODE NUMBER: Secondary ______ Postsecondary I470698

Florida CIP 0647.069900

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): _____ 7-9 _____ 9-12 x Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: REC VEH SR G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as Pre-Delivery Inspector, Service Technician, Service Writer, Service Coordinator, Parts Counter Person, and Sales person. This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: pre-delivery inspection, troubleshooting and repairing AC and DC electrical systems, freshwater systems, waste water systems, electrical brake systems, towing systems, suspension systems, vehicle interior, vehicle exterior, repair and service L.P systems, install vehicle accessories, service and repair appliances and air conditioning systems.

The content should include, but not be limited to, customer relations, communications, human relations, employability skills, and safe and efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in servicing and repairing recreational vehicles.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal.

In accordance with Section 233.0695 F.S. the minimum basic skills grade level required for this Postsecondary adult vocational program is: mathematics 9.0, language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

The typical length of this program for the average achieving student is 1,350 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01.0 Introduce Recreational Vehicle Service skills.
02.0 Apply electrical skills.
03.0 Apply mathematics skills.
04.0 Perform the pre-delivery inspection.
05.0 Perform preventive maintenance.
06.0 Troubleshoot and repair RV fluid power systems.
07.0 Identify basic heating and mechanical principles.
08.0 Troubleshoot LP gas systems.
09.0 Troubleshoot and repair electrical/electronic systems.
10.0 Perform metal processing/metallurgy skills.
11.0 Troubleshoot and repair water system services.
12.0 Troubleshoot and repair electrical brake systems.
13.0 Troubleshoot and repair towing systems.
14.0 Troubleshoot and repair suspension system.
15.0 Troubleshoot and repair air conditioning systems.
16.0 Troubleshoot and repair absorption refrigerators.
17.0 Troubleshoot and repair heating systems.
18.0 Troubleshoot and repair water heaters.
19.0 Perform customer relations functions.
20.0 Troubleshoot and repair vehicle interior.
21.0 Troubleshoot and repair vehicle exterior.
22.0 Demonstrate employability skills.
23.0 Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER ________

PROGRAM TITLE: Recreational Vehicle Service Technician POSTSECONDARY NUMBER: I470698

01.0 INTRODUCE RECREATIONAL VEHICLE SKILLS - The Student will be able to:

01.01 Complete orientation to recreational vehicle industry
01.02 Apply basic safety procedures
01.03 Use basic trade tools and equipment
01.04 Apply industrial codes and standards

02.0 APPLY ELECTRICAL SKILLS - The student will be able to:

02.01 Identify basic concepts of electrical circuits
02.02 Use electrical component symbols and diagrams
02.03 Identify component circuits and their requirements
02.04 Use electrical test meters
02.05 Use specialized hand tools
02.06 Apply DC principles
02.07 Apply soldering skills
02.08 Apply AC principles
02.09 Troubleshoot circuits containing electronic components
02.10 Troubleshoot/diagnose electrical circuits and components

03.0 APPLY MATHEMATICS SKILLS - The student will be able to:

03.01 Solve math problems involving fractions
03.02 Solve math problems involving algebraic equations
03.03 Use measurements
03.04 Solve basic trigonometric problems

04.0 PERFORM THE PRE-DELIVERY INSPECTION - The student will be able to:

04.01 Identify pre-delivery inspection procedures
04.02 Perform electrical system inspection
04.03 Perform LP gas system test
04.04 Perform water and drainage system check-out
04.05 Perform chassis, frame, and running gear inspection

05.0 PERFORM PREVENTIVE MAINTENANCE - The student will be able to:

05.01 Perform under-the-hood inspections
05.02 Service cooling and oil lubricating systems
05.03 Perform general inspection and adjustments
05.04 Prepare vehicle for storage inspection and trip preparation

06.0 TROUBLESHOOT AND REPAIR RV FLUID POWER SYSTEMS - The student will be able to:

06.01 Identify the principles of hydraulics
06.02 Identify hydraulic system components
06.03 Troubleshoot, repair and replace hydraulic system components
06.04 Identify principles of pneumatics
06.05 Identify pneumatic system components
06.06 Troubleshoot, repair and replace pneumatic system components

07.0 IDENTIFY BASIC HEATING AND MECHANICAL PRINCIPLES - The student will be able to:

07.01 Explain basic principles of mechanical advantage
07.02 Explain applications of energy converters
07.03 Perform efficiency calculations
07.04 Explain basic principles of heat

08.0 TROUBLESHOOT LP GAS SYSTEMS - The student will be able to:

08.01 Identify properties of LP gas
08.02 Identify RV propane system components and functions
08.03 Inspect, purge, fill and test containers
08.04 Inspect, replace, adjust propane system components
08.05 Troubleshoot and repair LP gas systems

09.0 TROUBLESHOOT AND REPAIR ELECTRICAL/ELECTRONICS SYSTEMS - The student will be able to:

09.01 Troubleshoot battery, alternator and charger
09.02 Troubleshoot and repair 120 volt AC distribution system
09.03 Troubleshoot 120 volt AC/12 volt converter systems
09.04 Troubleshoot and repair 12 volt distribution system
09.05 Perform gas engine generator tune up
09.06 Troubleshoot and repair generator alternators
09.07 Repair and install 12 volt motor and light fixtures
09.08 Install and troubleshoot antenna
09.09 Install and troubleshoot security system
09.10 Troubleshoot and repair leveling system
09.11 Troubleshoot and repair electrical steps
09.12 Troubleshoot and repair electronic systems

10.0 PERFORM METAL PROCESSING/METALLURGY SKILLS - The student will be able to:

10.01 Identify basic principles of metallurgy
10.02 Perform stick electrode welding techniques
10.03 Perform oxyacetylene welding techniques
10.04 Perform MIG welding techniques
10.05 Perform TIG welding techniques
10.06 Perform cutting operations
10.07 Perform sheet metal forming techniques
10.08 Perform plastic welding and joining techniques

11.0 TROUBLESHOOT AND REPAIR WATER SYSTEMS SERVICE - The student will be able to:

11.01 Identify RV water distribution system operations
11.02 Troubleshoot and repair fresh water components
11.03 Troubleshoot and repair plumbing fixtures
11.04 Troubleshoot and repair waste water components
11.05 Install water system

12.0 TROUBLESHOOT AND REPAIR ELECTRICAL BRAKE SYSTEMS - The student will be able to:

12.01 Troubleshoot electrical brake systems
12.02 Repair electrical brake systems
12.03 Install electrical brake systems

13.0 TROUBLESHOOT AND REPAIR TOWING SYSTEMS - The student will be able to:

13.01 Identify RV towing systems
13.02 Install towing systems

13.03 Install wiring systems
13.04 Troubleshoot and repair towing systems

14.0 TROUBLESHOOT AND REPAIR SUSPENSION SYSTEM - The student will be able to:

14.01 Identify suspension system components
14.02 Install add-on suspension systems
14.03 Install steer safe devices
14.04 Troubleshoot and repair air suspension systems
14.05 Troubleshoot and repair rubber suspension systems

15.0 TROUBLESHOOT AND REPAIR AIR CONDITIONING SYSTEMS - The student will be able to:

15.01 Analyze basic air conditioning refrigeration systems and theory
15.02 Test basic air condition/refrigeration systems
15.03 Troubleshoot and repair electrical circuits and components
15.04 Use brazing skills
15.05 Evacuate and recharge air conditioning system
15.06 Troubleshoot and repair refrigeration systems
15.07 Install air conditioner

16.0 TROUBLESHOOT AND REPAIR ABSORPTION REFRIGERATORS - The student will be able to:

16.01 Identify absorption systems theory
16.02 Troubleshoot cooling systems
16.03 Remove and install refrigerator cooling system
16.04 Troubleshoot and repair electrical systems
16.05 Troubleshoot and repair gas systems

17.0 TROUBLESHOOT AND REPAIR HEATING SYSTEMS - The student will be able to:

17.01 Identify heating system theory
17.02 Troubleshoot and repair gravity-type furnace
17.03 Troubleshoot and repair pilot piezo-type furnace
17.04 Troubleshoot and repair direct spark ignition furnace

18.0 TROUBLESHOOT AND REPAIR WATER HEATERS - The student will be able to:

18.01 Identify water heating systems theory
18.02 Troubleshoot and repair electrical water heaters
18.03 Troubleshoot and repair manual pilot ignition water heaters
18.04 Troubleshoot and repair direct spark ignition water heaters

19.0 PERFORM CUSTOMER RELATIONS FUNCTIONS - The student will be able to:

19.01 Apply customer service communications skills
19.02 Apply customer service techniques

20.0 TROUBLESHOOT AND REPAIR VEHICLE INTERIOR - The student will be able to:

20.01 Repair and replace cabinets, hardware and trim
20.02 Repair interior surface defects
20.03 Repair floors and floor coverings
20.04 Repair and install window coverings
20.05 Repair and replace interior front-end group

21.0 TROUBLESHOOT AND REPAIR VEHICLE EXTERIOR - The student will be able to:

21.01 Repair and replace metal siding and roof

21.02 Repair and replace fiberglass surface components
21.03 Paint and detail exterior surface
21.04 Repair and replace canvas and screening
21.05 Troubleshoot and repair roof lift mechanisms
21.06 Repair and replace windows and frames
21.07 Repair and replace hardware, doors and compartments
21.08 Repair air and water leaks

22.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

22.01 Conduct a job search.
22.02 Secure information about a job.
22.03 Identify documents which may be required when applying for a job interview.
22.04 Complete a job application form correctly.
22.05 Demonstrate competence in job interview techniques.
22.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
22.07 Identify acceptable work habits.
22.08 Demonstrate knowledge of how to make job changes appropriately.
22.09 Demonstrate acceptable employee health habits.
22.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

23.01 Define entrepreneurship.
23.02 Describe the importance of entrepreneurship to the American economy.
23.03 List the advantages and disadvantages of business ownership.
23.04 Identify the risks involved in ownership of a business.
23.05 Identify the necessary personal characteristics of a successful entrepreneur.
23.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Related Trade and Industrial Technology

CODE NUMBER: Secondary _______ Postsecondary I469929

Florida CIP 0646.999902

SECONDARY
SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT
VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other30,31

CERTIFICATION COVERAGE: ANY INDUSTRIAL ED G

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to prepare students for employment as engineering technicians (22599228), maintenance repairers, general (85132625), machinery maintenance workers (85128623), machine operators (92997854), precision woodworkers (89399709), science technicians (715059901), food preparation workers (65038416), mechanics and installers (85999663), and construction workers (87899575). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: applied general education skills (English, mathematics, physics); tools, machinery and equipment appropriate to various trade and industrial occupations; technical recording and reporting; and a variety of miscellaneous skills to provide a broad base of knowledge that supports trade or industry specific education and training in specialty areas.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: recording and reporting of data, the application of problem-solving techniques, interpretation of shop and working drawings, basic trade and industrial English and mathematics skills, the application of appropriate specifications, the preparation of data or laboratory logbooks, the application of principles of physics. Students also gain practical experience in the application of safety principles and procedures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work

station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic mathematics and English skills grade level required for this postsecondary adult vocational program is the same as the level required for the trade or industry specific program the student intends to enter. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate appropriate trade or industry related English skills.
02. Apply trade or industry related mathematical concepts and perform trade or industry related calculations.
03. Demonstrate trade or industry related applied physics skills.
04. Apply and use safety rules and standards.
05. Apply trade or industry related shop or laboratory skills.
06. Demonstrate knowledge and use of trade or industry related tools, machinery and equipment.
07. Demonstrate a basic knowledge of trade or industry related shop or working drawings.
08. Demonstrate the ability to operate and use appropriate trade and industry computer hardware and software.
09. Demonstrate proficiency in technical recording and reporting.
10. Demonstrate and apply knowledge of miscellaneous trade and industry related skills.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Related Trade and Industrial Technology POSTSECONDARY NUMBER: I469929

01.0 DEMONSTRATE APPROPRIATE TRADE OR INDUSTRY RELATED ENGLISH SKILLS--The student will be able to:

01.01 Identify and define frequently used trade or industry related terms by sight.
01.02 Determine the main idea of trade or industry related memos and instructions.
01.03 Identify and list the order of events in a set of trade or industrial specifications/instructions.
01.04 Write a statement of how to follow a given set of written trade or industrial instructions.
01.05 Obtain appropriate trade or industry related information from reference material.
01.06 Identify sources from which to obtain trade or industry related information.
01.07 Demonstrate basic trade or industry related English writing skills.
01.08 Write a paragraph presenting trade or industry related information in chronological order.
01.09 Write a trade or industry related request for personnel, request for materials or supplies or request for information.
01.10 Write a clear, concise and sequenced series of brief statements describing the steps of a trade or industry related process or event.
01.11 Use a proper form when writing a simple trade or industry related business letter and addressing an envelope for it.
01.12 Write a trade or industry related letter of request, adjustment, complaint, application or opinion which contains necessary and accurate information.
01.13 Proofread trade or industry related reports for spelling.
01.14 Write a trade or industry related memorandum using a proper format.

02.0 APPLY TRADE OR INDUSTRY RELATED MATHEMATICAL CONCEPTS AND PERFORM APPROPRIATE TRADE OR INDUSTRY RELATED CALCULATIONS--The student will be able to:

02.01 Read and interpret measuring devices.
02.02 Add 100 addition combinations.
02.03 Add two digit numbers.
02.04 Add three-digit numbers.
02.05 Subtract 100 subtraction combinations.
02.06 Subtract two, three and four-digit numbers.
02.07 Solve one-digit divisor problems.
02.08 Solve two-digit divisor problems.
02.09 Solve three-digit divisor problems.
02.10 Solve multiplication facts.
02.11 Multiply by a one-digit factor.
02.12 Multiply by a two-digit factor.
02.13 Identify parts of a fraction.
02.14 Solve fractional word problems.
02.15 Convert fractions.
02.16 Solve decimal notations.
02.17 Solve number word problems.
02.18 Round to nearest whole number.

02.19 Add decimals.
02.20 Divide a decimal by a decimal.
02.21 Divide a whole number by a decimal.
02.22 Write fractions as decimals and percents.
02.23 Write percents as fractions and decimals.
02.24 Solve percent problems.
02.25 Compute board feet.
02.26 Compute cost of materials.
02.27 Solve basic ratio and proportion problems.
02.28 Operate simple hand-held calculators.
02.29 Convert board feet to linear feet and vice versa.
02.30 Read, interpret and apply metric conversion tables.
02.31 Solve basic algebraic problems.
02.32 Solve basic geometric problems.
02.33 Solve basic trigonometric problems.
02.34 Name the seven basic units in the International System of units (SI) and give the symbol and quantity measured for each.
02.35 Name the prefix symbol for the multiple 10 to the -18th.
02.36 Calculate a weight in pounds, given a mass in kilograms.
02.37 Identify the term angle.
02.38 Measure an angle, given a protractor.
02.39 Define the term degree.
02.40 Define the term radian.
02.41 Define the term sine of an angle.
02.42 Define the term cosine of an angle.
02.43 Define the term tangent of an angle.
02.44 Apply the Pythagorean theorem to determine the third side of a triangle when given a right triangle with two known sides.
02.45 List at least four common examples of scalar quantities.
02.46 List at least four common examples of vector quantities.
02.47 Draw a technically-acceptable graph from a table of experimental data suitable for plotting on rectangular-coordinate graph paper; the resulting graph may be linear or nonlinear.
02.48 Write a given decimal number in scientific notation.
02.49 Write a number given in scientific notation in decimal form.
02.50 Add, subtract, multiply or divide using power-of-ten numbers.
02.51 Find logarithms and antilogarithms of given numbers.
02.52 Multiply and divide numbers and solve equations using the three theorems of logarithms for products and quotients.
02.53 Measure linear dimensions with a vernier caliper.

03.0 DEMONSTRATE TRADE OR INDUSTRY RELATED APPLIED PHYSICS SKILLS--The student will be able to:

03.01 Demonstrate applied skills in mechanics.
03.02 Apply and solve vectors.
03.03 Solve force and motion problems.
03.04 Solve work, energy and power problems.
03.05 Solve friction problems.
03.06 Solve circular motion problems.
03.07 Solve rotational motion problems.
03.08 Solve problems involving the properties of solids.
03.09 Solve problems involving the properties of liquids.
03.10 Solve problems involving the properties of gases.
03.11 Demonstrate applied skills in heat, light and sound.
03.12 Solve temperature and heat problems.
03.13 Solve change-of-state problems.
03.14 Solve heat transfer problems.
03.15 Solve thermodynamic problems.
03.16 Solve refrigeration and air conditioning problems.
03.17 Solve harmonic motion problems.
03.18 Solve sound wave problems.

03.19 Solve light problems.
03.20 Solve optical problems.
03.21 Demonstrate applied skills in electricity and magnetism.
03.22 Solve electric circuit problems.
03.23 Solve electromagnetic problems.
03.24 Solve alternating current problems.
03.25 Solve generator and motor problems.
03.26 Solve electrostatic problems.
03.27 Solve magnetism problems.
03.28 Apply knowledge of strengths of materials.
03.29 Solve equilibrium problems.
03.30 Solve stress and strain problems.
03.31 Solve centroid and inertia problems.
03.32 Solve connection and joint problems.
03.33 Solve problems with beam stresses.
03.34 Solve torsion problems.
03.35 Solve compression problems.
03.36 Solve tension problems.
03.37 Solve force combination problems.

04.0 APPLY AND USE SAFETY RULES AND STANDARDS--The student will be able to:

04.01 Demonstrate knowledge and use of general safety rules.
04.02 Apply general shop or laboratory safety rules and procedures.
04.03 Demonstrate the operation of shop safety devices.
04.04 Apply fire safety rules and procedures.
04.05 Apply rules and procedures for electrical safety.
04.06 Apply safety rules and procedures applicable to stationary or moving machinery and the use and maintenance or machine safety guards.
04.07 Apply safety rules and procedures applicable to the use of moving transports (forklifts, conveyors, small electric trucks and flatbeds, etc.) and those to be followed where such transports are being operated.
04.08 Apply safety rules and procedures to be followed when operating or using hoists, cranes, elevators and other lifting equipment.
04.09 Apply safety rules and procedures to be followed when constructing or using scaffolding.
04.10 Demonstrate safety procedures to be followed in areas where heavy equipment (earth haulers, dump trucks, cranes, scrapers, bulldozers, various heavy trucks, etc.) is being operated.
04.11 Demonstrate minimal first aid skills.
04.12 Identify safety headgear and where, how and why it is to be used.
04.13 Identify safety straps and belts and where, how and why they are to be used.
04.14 Identify safety clothing (gloves, nets, aprons, goggles, soft-soled shoes or caulked boots, etc.) and where, how and why it is to be used.
04.15 Determine and demonstrate how to apply the Occupational Safety Health Administration (OSHA) regulations regarding manufacturing enclosures and machinery.
04.16 Determine and demonstrate how to apply the Occupational Safety Health Administration (OSHA) regulations regarding air and noise pollution, their control and the maximum levels allowable.
04.17 Determine and demonstrate how to apply the Occupational Safety Health Administration (OSHA) regulations regarding safeguards required when using small hand and power tools and larger machine tools.
04.18 Determine the rules applicable to the requirements for claims involving disability and unemployment insurance.

05.0 APPLY TRADE OR INDUSTRY RELATED SHOP OR LABORATORY SKILLS--The student

will be able to:

05.01 Apply appropriate reading and writing skills in the writing and preparation of shop or laboratory reports or logbooks and in the technical recording and reporting of shop or laboratory data.
05.02 Apply appropriate mathematical concepts and calculations to solve given shop or laboratory projects or assignments.
05.03 Apply appropriate physics concepts and calculations in the solution of given shop or laboratory project or assignments.
05.04 Apply appropriate safety rules, regulations and procedures in a shop or laboratory setting.
05.05 Demonstrate the ability to research, locate and apply the appropriate specifications to given trade or industry related projects.
05.06 Apply knowledge of working drawings to produce usable shop or laboratory products for various trades or industries.

06.0 DEMONSTRATE KNOWLEDGE AND USE OF TRADE OR INDUSTRY RELATED TOOLS, MACHINERY, AND EQUIPMENT--The student will be able to:

06.01 Identify and explain the use of the hand tools used in the construction industries.
06.02 Demonstrate knowledge and use of the smaller power tools.
06.03 Identify and explain the use of the smaller power tools used in the construction industries.
06.04 Identify and explain the use of the larger tools and machinery used in the construction industries.
06.05 Demonstrate knowledge and use of heavy machinery and equipment.
06.06 Identify and explain the use of the heavy machinery and equipment used in the construction industries.

07.0 DEMONSTRATE A BASIC KNOWLEDGE OF TRADE AND INDUSTRY RELATED WORKING DRAWINGS--The student will be able to:

07.01 Read and interpret drafting symbols.
07.02 Read and apply appropriate information from simple trade and industry drawings.
07.03 Locate, read and apply trade and industry specifications.

08.0 DEMONSTRATE THE ABILITY TO OPERATE AND USE APPROPRIATE TRADE AND INDUSTRY COMPUTER HARDWARE AND SOFTWARE--The student will be able to:

08.01 Operate computer equipment and peripherals.
08.02 Interpret printed output.
08.03 Demonstrate post-processing file management skills.
08.04 Create computer-output microfiche (COM) files.
08.05 Create photo processing files.
08.06 Create numerical control files.

09.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

09.01 Record data and design curves and graphs.
09.02 Write reports and make oral presentations.
09.03 Maintain test and trade or industry data logs.
09.04 Make equipment-failure reports.
09.05 Specify and requisition simple parts and supplies.
09.06 Compose technical letters and memoranda.
09.07 Write formal reports of laboratory experiences.
09.08 Drift preventive maintenance and calibration procedures.

10.0 DEMONSTRATE AND APPLY KNOWLEDGE OF MISCELLANEOUS TRADE AND INDUSTRY

RELATED SKILLS--The student will be able to:

10.01 Demonstrate knowledge and use of scheduling techniques.
10.02 Create trade and industry related program education and review technique (PERT) charts to the scheduling of a simple hypothetical project.
10.03 Create trade and industry related critical path method (CPM) charts to the scheduling of a simple hypothetical project.
10.04 Create trade and industry related Gantt charts or lists to the scheduling of simple hypothetical project.
10.05 Demonstrate knowledge and use of electronic calculators and other general work-support tools.
10.06 Demonstrate knowledge and use of trade and industry related reference materials.
10.07 Demonstrate the ability to read and interpret appropriate trade and industrial blueprints.
10.08 Demonstrate knowledge and ability in trade and industry related problem-solving.
10.09 Demonstrate knowledge and use of trade or industry terms and terminology.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents that may be required when applying for a job.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential and Commercial Carpentry

CODE NUMBER: Secondary _______ Postsecondary I460201

Florida CIP 0646.020100

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS___ POSTSECONDARY ADULT VOCATIONAL CREDITS_x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: TEC CONSTR @ 7 G CARPENTRY @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as construction carpenters (87102541), (860.381-022), or to provide supplemental training to persons already employed in the occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, laying out, repairing, and fabricating and erecting residential and commercial structures and fixtures using hand tools and power tools.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program to provide instruction in the use of hand and power tools, selection and use of materials, estimating, and blueprint reading.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., (VICA) is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skill levels required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate shop and occupational safety skills.
02. Demonstrate basic knowledge of the construction industry.
03. Demonstrate knowledge of basic mathematics for carpentry.
04. Read blueprints.
05. Utilize hand tools.
06. Identify characteristics of lumber.
07. Utilize power tools.
08. Perform site preparation and layout activities.
09. Set up and use a transit and builder's level.
10. Demonstrate proper handling and storage of materials.
11. Demonstrate knowledge of form construction.
12. Cut and install framing members for a floor.
13. Cut and install a wall and partition framing.
14. Frame a roof.
15. Install and brace roof trusses.
16. Install exterior coverings and trim.
17. Install doors.
18. Install windows.
19. Perform stair and step layout and construction.
20. Install interior wall and ceiling covering.
21. Install cabinets and shelving.
22. Demonstrate skill in tilt-up and pre-cast construction.
23. Demonstrate skill in structural shoring.
24. Demonstrate knowledge of timber construction.
25. Install decking and sheathing.
26. Demonstrate appropriate communication skills.
27. Demonstrate appropriate understanding of basic science.
28. Demonstrate employability skills.
29. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Residential and Commercial Carpentry POSTSECONDARY NUMBER: I460201

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Maintain a clean, orderly and safe work area.
01.02 Operate a fire extinguisher.
01.03 Qualify in and apply basic first aid procedures.
01.04 Identify common safety hazards.

02.0 DEMONSTRATE BASIC KNOWLEDGE OF THE CONSTRUCTION INDUSTRY--The student will be able to:

02.01 Describe the role of the construction industry within the free enterprise system.
02.02 Identify employment opportunities in the construction industry.

03.0 DEMONSTRATE KNOWLEDGE OF BASIC MATHEMATICS FOR CARPENTRY--The student will be able to:

03.01 Solve basic math problems related to carpentry applications.
03.02 Solve for square foot and cubic foot measurement.
03.03 Solve for board foot measurement.
03.04 Solve for linear foot measurement.
03.05 Read, interpret and apply metric conversion.

04.0 READ BLUEPRINTS--The student will be able to:

04.01 Read an architect's rule.
04.02 Read an engineer's rule.
04.03 Identify architectural and engineering elevations and schedules.
04.04 Identify lines and blueprint symbols.
04.05 Interpret blueprints and specifications.

05.0 UTILIZE HAND TOOLS--The student will be able to:

05.01 Identify various handtools.
05.02 Select correct tool for job.
05.03 Demonstrate safe and proper use of handtools.

06.0 IDENTIFY CHARACTERISTICS OF CONSTRUCTION LUMBER--The student will be able to:

06.01 Identify the grades and species of lumber.
06.02 Identify the actual and nominal sizes of lumber.
06.03 Identify the grades of plywood.
06.04 Identify defects and blemishes that affect durability and strength in lumber.

07.0 UTILIZE POWER TOOLS--The student will be able to:

07.01 Identify power tools and machines.
07.02 Select the correct power tool according to the job.
07.03 Operate and care for power tools properly

08.0 PERFORM SITE PREPARATION AND LAYOUT ACTIVITIES--The student will be able

to:

08.01 Identify building layout.
08.02 Erect batter boards and locate building lines.
08.03 Locate building line points on batter boards using building level.
08.04 Locate building lines on a plot plan.
08.05 Square a building using the 6-8-10 method and the diagonal method.

09.0 SET UP AND USE A TRANSIT AND BUILDER'S LEVEL--The student will be able to:

09.01 Set up and adjust transit or builders level over point and establish lines over two points.
09.02 Read the self-reading rod (positive and direct reading).
09.03 Perform differential leveling.

10.0 DEMONSTRATE PROPER HANDLING AND STORAGE OF MATERIALS--The student will be able to:

10.01 Receive and store materials at a job site.
10.02 Identify common fasteners used in construction.

11.0 DEMONSTRATE KNOWLEDGE OF FORM CONSTRUCTION--The student will be able to:

11.01 Identify characteristics and types of forms.
11.02 Install inbeds for various form.
11.03 Identify styles of footings.
11.04 Construct and set forms for a continuous form.
11.05 Construct and set forms for a pile cap.
11.06 Construct and set a pier footing form.
11.07 Strip a form for relocation.
11.08 Construct a straight wall with representative patented forms.
11.09 Construct gang forms for battered wall.
11.10 Construct circular wall forms (in place).
11.11 Construct panel forms.
11.12 Construct slip forms.
11.13 Construct edge forms for a floor with or without foundation walls and for a stoop.
11.14 Construct various types of curb and gutter forms.
11.15 Construct median forms.
11.16 Construct column forms (round and squared).
11.17 Construct spandrel, interior, and inverted post-tensioned beam forms.
11.18 Construct flying forms for a flat slab.
11.19 Construct various staircase forms.
11.20 Construct bridge deck forms.
11.21 Construct fireproof encasement forms for columns and beams.

12.0 CUT AND INSTALL FRAMING MEMBERS FOR A FLOOR--The student will be able to:

12.01 Identify framing members.
12.02 Build box sill and install floor joist.
12.03 Install bridging.
12.04 Lay subfloor.
12.05 Install floor joists for cantilever floor.

13.0 CUT AND INSTALL A WALL AND PARTITION FRAMING--The student will be able to:

13.01 Identify framing members used in wall and partition construction.
13.02 Layout wall lines and partition locations on floor.

13.03 Cut studs, trimmers, cripples headers and firesteps to length.
13.04 Build T's, corners and headers.
13.05 Lay out and assemble wall sections.
13.06 Install wall sheathing.
13.07 Install metal door bucks.
13.08 Install steel studs.

14.0 FRAME A ROOF--The student will be able to:

14.01 Identify roof members.
14.02 Identify roof styles.
14.03 Identify roof framing units.
14.04 Compute length of common hip and jack rafters.
14.05 Layout rafter and ceiling hoist location on plate and ridge on center.
14.06 Layout, cut and erect rafters.
14.07 Install roof sheathing.
14.08 Install asphalt composition strip shingles.

15.0 INSTALL AND BRACE ROOF TRUSSES--The student will be able to:

15.01 Identify the main parts of trusses.
15.02 Identify hardware used in truss construction.
15.03 Install and brace trusses.

16.0 INSTALL EXTERIOR COVERING AND TRIM--The student will be able to:

16.01 Identify styles of cornice.
16.02 Identify styles of siding.
16.03 Build a box cornice.
16.04 Install siding and trim.

17.0 INSTALL DOORS--The student will be able to:

17.01 Install door frame and hang door.
17.02 Identify parts of a door frame.
17.03 Install door hardware.

18.0 INSTALL WINDOWS--The student will be able to:

18.01 Identify parts of a window unit.
18.02 Install a window unit.

19.0 PERFORM STAIR AND STEP LAYOUT AND CONSTRUCTION--The student will be able to:

19.01 Identify parts of a staircase.
19.02 Calculate the number or risers and treads for a staircase.
19.03 Layout, cut and assemble a staircase (rough and finish).

20.0 INSTALL INTERIOR WALL AND CEILING COVERING--The student will be able to:

20.01 Install paneling and trim.
20.02 Install ceiling materials.
20.03 Install furring strips.
20.04 Install drywall.
20.05 Install insulation material.
20.06 Install laminated gypsum wallboard.
20.07 Cut and install plastic laminates.

21.0 INSTALL CABINETS AND SHELVING--The student will be able to:

21.01 Identify parts of a cabinet.
21.02 Identify types of cabinet door installation.
21.03 Identify types of cabinet hardware.
21.04 Install cabinet hardware.
21.05 Install custom built cabinet.
21.06 Install shelving.

22.0 DEMONSTRATE SKILL IN TILT-UP AND PRE-CASE CONSTRUCTION--The student will be able to:

22.01 Brace and erect tilt-up panels.
22.02 Erect and install pre-case wall panels using rolling metal forms.
22.03 Set pre-cast beams.
22.04 Install pre-case parapet wall sections.

23.0 DEMONSTRATE SKILL IN STRUCTURAL SHORING--The student will be able to:

23.01 Erect patented design shoring.
23.02 Construct and erect conventional shoring.
23.03 Erect safety and shoring for excavation.
23.04 Erect a deck using span-all metal shoring.

24.0 DEMONSTRATE KNOWLEDGE OF TIMBER CONSTRUCTION--The student will be able to:

24.01 Identify structural timber components.
24.02 Install heavy structural timber.

25.0 INSTALL DECKING AND SHEATHING--The student will be able to:

25.01 Identify types of planking.
25.02 Install sheathing.
25.03 Install wood and metal splice plates.
25.04 Install metal hangers.
25.05 Install metal shoe connections.
25.06 Install a column cap.
25.07 Install metal strap and shear plate connections.
25.08 Install lateral ties and split rings.

26.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

26.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
26.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
26.03 Read and follow written and oral instructions.
26.04 Answer and ask questions coherently and concisely.
26.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
26.06 Demonstrate appropriate telephone/communication skills.

27.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

27.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
27.02 Draw conclusions or make inferences from data.
27.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

27.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

28.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

28.01 Conduct a job search.
28.02 Secure information about a job.
28.03 Identify documents which may be required when applying for a job interview.
28.04 Complete a job application form correctly.
28.05 Demonstrate competence in job interview techniques.
28.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
28.07 Identify acceptable work habits.
28.08 Demonstrate knowledge of how to make appropriate job changes.
28.09 Demonstrate acceptable employee health habits.
28.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

29.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

29.01 Define entrepreneurship.
29.02 Describe the importance of entrepreneurship to the American economy.
29.03 List the advantages and disadvantages of business ownership.
29.04 Identify the risks involved in ownership of a business.
29.05 Identify the necessary personal characteristics of a successful entrepreneur.
29.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential and Commercial Electric Wiring

CODE NUMBER: Secondary ______ Postsecondary 1460302

Florida CIP 0646.030200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__ Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians (87202549), residential and commercial electricians (824.261-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: installation, maintenance and repair of residential and commercial electrical systems. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, test, equipment, materials and processes found in the industry. Students are also instructed in the following: installation, maintenance, repair and modification of residential and commercial electrical systems and components in accordance with existing codes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic electrical laboratory safety and calculation skills.
02. Demonstrate basic electrical circuit skills.
03. Demonstrate direct current (DC) circuit skills.
04. Demonstrate alternating current (AC) circuit skills.
05. Demonstrate residential wiring skills.
06. Demonstrate commercial wiring skills.
07. Demonstrate specialized electrical skills.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Residential and Commercial Electric Wiring POSTSECONDARY NUMBER: 1460302

01.0 PERFORM BASIC ELECTRICAL LABORATORY SAFETY AND CALCULATION SKILLS--The student will be able to:

01.01 Apply lab policies and procedures for safety.
01.02 Operate lab safety devices.
01.03 Demonstrate personal safety procedures.
01.04 Solve basic math problems related to electrical work.
01.05 Drill holes in metal for electrical wiring.
01.06 Measure voltage, amperage and resistance using volt-Ohm meters (VOM) and digital volt-Ohm meters (DVM).
01.07 Describe various ways that electricity is produced.
01.08 Comprehend electrical and electrician's codes and terminology.
01.09 Relate electricity to the nature of matter.
01.10 Solve basic trigonometric functions related to electrical wiring.

02.0 DEMONSTRATE BASIC ELECTRICAL CIRCUIT SKILLS--The student will be able to:

02.01 Analyze a series, series-parallel and parallel circuit.
02.02 Construct a series, series-parallel and parallel circuit.
02.03 Troubleshoot a series, series-parallel and parallel circuit.
02.04 Draw each type circuit and calculate the circuit values.

03.0 DEMONSTRATE DIRECT CURRENT (DC) CIRCUIT SKILLS--The student will be able to:

03.01 Define power and energy.
03.02 Apply and relate Ohm's Law.
03.03 Measure conductance and resistance of conductors and insulators.
03.04 Define magnetic properties of circuits and devices.
03.05 Define the principles of electromagnetism.

04.0 DEMONSTRATE ALTERNATING CURRENT (AC) CIRCUIT SKILLS--The student will be able to:

04.01 Identify physical and electrical characteristics of capacitors and inductors.
04.02 Analyze and measure inductive reactance (RL) and reactive capacitance (RC) time constants.
04.03 Discuss motor theory and operation.
04.04 Discuss generator theory and operation.
04.05 Construct a parallel and series RL circuit.
04.06 Construct a parallel and series RC circuit.
04.07 Construct a parallel and series inductive reactance capacitance (RLC circuit.
04.08 Set up and utilize a watt-hour meter.
04.09 Measure voltage and current in circuits with transformers.
04.10 Construct, analyze and troubleshoot AC capacitance circuits.
04.11 Construct, analyze and troubleshoot AC inductive circuits.
04.12 Construct, analyze and troubleshoot polyphase circuits.
04.13 Apply principles of transformers to AC circuits.
04.14 Set up and operate impedance bridges for AC circuits.
04.15 Install capacitors in series in AC circuits.
04.16 Develop a time constant curve.
04.17 Install inductors in series in AC circuits.

04.18 Construct, analyze and troubleshoot power and control transformers.

05.0 DEMONSTRATE RESIDENTIAL WIRING SKILLS--The student will be able to:

05.01 Identify tools and material to complete a job.
05.02 Select wire appropriate for job requirements.
05.03 Apply regulations for placement of electrical devices.
05.04 Install conductors and cable.
05.05 Install standard outlets and switch boxes.
05.06 Install cards on major appliances (whips).
05.07 Interpret electrical wiring symbols.
05.08 Install switches, receptacles and dimmers.
05.09 Operate and maintain power generators.
05.10 Operate and maintain power tools.
05.11 Identify residential wiring requirements based on floor plan.
05.12 Identify residential wiring installation specifications.
05.13 Draw a residential wiring plan.
05.14 Install a single-pole switched lighting circuit.
05.15 Install a three-way switched lighting circuit.
05.16 Install a four-way combination circuit.
05.17 Connect a recessed lighting fixture.
05.18 Connect a fluorescent lighting fixture.
05.19 Connect a surface lighting fixture.
05.20 Install and wire a duplex receptacle outlet circuit.
05.21 Install and wire an split-circuit duplex receptacle outlet circuit.
05.22 Install and wire a special purpose receptacle outlet circuit.
05.23 Install and wire a space heating circuit.
05.24 Install and wire a low-voltage signal system.
05.25 Install conduit systems.
05.26 Comply with National Electrical Code (NEC) requirements for residential wiring.
05.27 Wire a heat-pump circuit.
05.28 Wire a forced air heating circuit.
05.29 Install a service entrance main panel.
05.30 Install a service entrance meter base.
05.31 Install a remote control lighting circuit.
05.32 Install an emergency alarm system.
05.33 Install a swimming pool electrical system.
05.34 Construct control circuits from schematics.
05.35 Calculate job installation costs.

06.0 DEMONSTRATE COMMERCIAL WIRING SKILLS--The student will be able to:

06.01 Interpret a commercial wiring floor plan.
06.02 Identify commercial wiring specifications.
06.03 Draw a commercial electrical floor plan.
06.04 Install flexible, thin-wall, rigid and plastic conduit.
06.05 Install a wire mold.
06.06 Install a duct system.
06.07 Install conductors in a conduit.
06.08 Install a commercial lighting circuit.
06.09 Comply with high voltage (over 600V) wiring requirements.
06.10 Select and install power transformers to the limitations or job.
06.11 Install wiring in hazardous areas.
06.12 Apply advanced troubleshooting techniques.
06.13 Comply with N.E.C. requirements for commercial wiring.
06.14 Comply with local inspection authority regulations.
06.15 Install a commercial three-phase receptacle circuit.
06.16 Install a low-voltage signal communication circuit.
06.17 Install an emergency lighting system.

06.18 Calculate commercial service entrance requirements.
06.19 Install commercial service entrance.
06.20 Install mobile home park service.
06.21 Install elevator service.

07.0 PERFORM SPECIALIZED ELECTRICAL SKILLS--The student will be able to:

07.01 Measure voltage across a resistor and inductor and varying frequencies and determine values of resistance and inductance in a series RL circuit.
07.02 Construct, analyze and troubleshoot solid state control devices.
07.03 Measure current through a resistor and inductor at varying frequencies and determine values of resistance and inductance in a parallel RL circuit.
07.04 Measure voltage across a resistor and capacitor at varying frequencies and determine values of resistance and capacitance in a series RC circuit.
07.05 Measure current through a resistor and capacitor at varying frequencies and determine values of resistance and capacitance in a parallel RC circuit.
07.06 Measure voltage across a resistor, capacitor and inductor at varying frequencies and determine values of resistance, inductance and capacitance in a series RLC circuit.
07.07 Measure a current through a resistor, capacitor and inductor at varying values of resistance, capacitance and inductance in a parallel RLC circuit.
07.08 Measure current and voltages in solid state control circuits.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to

work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents that may be required when applying for a job.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential and Commercial Plumbing

CODE NUMBER: Secondary ______ Postsecondary I460503

Florida CIP 0646.050300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G PLUMBIN @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a plumber (87502560), (862.381-030). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: assembly, installation and repair of pipes, fittings and fixtures for heating, water and drainage systems according to specifications and plumbing codes. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: use of plumbing tools to lay out, build, test and maintain plumbing systems in both residential and commercial applications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
SECONDARY NUMBER:

PROGRAM TITLE: Residential and Commercial Plumbing
POSTSECONDARY NUMBER: 1460503

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of plumbing.
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify plumbing fixtures and appliances.
01.09 Read and interpret and comply with manufacturers' schematics and specifications.
01.10 Find information in technical literature.
01.11 Give reports orally and in writing.
01.12 Listen to and comply with oral and written instructions.

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Join plastic pipe using the adapter solvent cement method.
02.02 Bend steel pipe with a chain vise and torch.
02.03 Cut steel pipe with a one wheel steel pipe cutter.
02.04 Cut steel pipe with a four-wheel steel pipe cutter.
02.05 Join plastic pipe to steel pipe.
02.06 Thread steel pipe with a power driven vise stand.
02.07 Cut copper tubing or pipe with a hacksaw.
02.08 Cut copper tubing or pipe with a tubing cutter.
02.09 Bend copper tubing or pipe with a spring bender.
02.10 Join copper tubing or pipe to copper tubing or pipe.
02.11 Join copper tubing to brass pipe.
02.12 Join copper tubing with a compressed connector.
02.13 Join copper tubing to steel pipe.
02.14 Join copper tubing or pipe to plastic pipe using the seat method.
02.15 Join copper tubing or pipe to plastic pipe.

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's scale
03.03 Read and interpret a six foot rule.
03.04 Recognize and identify basic plumbing symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select fixtures.

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:

04.01 Determine a materials list.
04.02 Select material specifications.

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND)--The student will be able to:

05.01 Lay out a job on site.

05.02 Install building drain, waste and vent systems.
05.03 Install distribution systems.
05.04 Install water service.
05.05 Install building sewer/septic tanks and /or approved sewer systems.
05.06 Test the first rough.

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site.
06.02 Install hangers and supports.
06.03 Install building drain, waste and vent systems.
06.04 Install water distribution systems.
06.05 Test the second rough.

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to:

07.01 Distribute and place fixtures and appliances.
07.02 Install and trim out fixtures.
07.03 Install closet flanges.
07.04 Install speed stops on water pipes.
07.05 Trim out a lavatory.
07.06 Trim out water closets.
07.07 Trim out bath tubs.
07.08 Trim out showers.
07.09 Trim out kitchen sinks.
07.10 Trim out washing machine drains and piping.
07.11 Install garbage disposals.
07.12 Hook up ice makers.
07.13 Install and trim out water heaters.
07.14 Install and hook up dishwashers.
07.15 Test and inspect the final installation.

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING, PLUMBING SYSTEMS--The student will be able to:

08.01 Troubleshoot and diagnose systems.
08.02 Repair sewer mains.
08.03 Repair water mains.
08.04 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers and trip levers.
08.05 Repair leaks in traps.
08.06 Repair leaks in faucets.
08.07 Install sink strainers.
08.08 Install heater elements.
08.09 Replace or repair fixture water supply pipes.
08.10 Reseal toilets to flanges.
08.11 Test and inspect repaired systems.
08.12 Explain the nature of the problem(s), remedial action(s) needed and advise the customer on preventive maintenance.
08.13 Prepare a job ticket.
08.14 Price a job and write the invoice.

09.0 DEMONSTRATE KNOWLEDGE OF PLUMBING CODES--The student will be able to:

09.01 Describe and explain the purpose of plumbing codes.
09.02 Apply basic theory and principles of plumbing in relation to the codes.
09.03 Read and locate information in the plumbing code.
09.04 Explain and define terminology used in the code.

09.05 Explain why the code may supersede manufacturer's

10.0 DEMONSTRATE PROFICIENCY IN INSTALLING DOMESTIC HOT WATER HEATING AND CIRCULATING SYSTEMS--The student will be able to:

10.01 Explain the basic theory of domestic hot water heating and circulating systems.
10.02 Design, size and lay out a system.
10.03 Select equipment and materials in accordance with job specifications.
10.04 Install distribution systems.
10.05 Apply insulation.
10.06 Install equipment controls.
10.07 Install safety devices.

11.0 DEMONSTRATE PROFICIENCY IN SELECTING AND INSTALLING INSULATION--The student will be able to:

11.01 Explain the basic theory of insulation.
11.02 Select materials in accordance with job specifications.
11.03 Explain the different methods of applying insulation.

12.0 DEMONSTRATE PROFICIENCY IN INSTALLING INTERCEPTORS AND SEPARATORS--The student will be able to:

12.01 Identify the various types of interceptors and separators.
12.02 Explain the theory and function of various interceptors and separators.
12.03 Install and maintain lint traps.
12.04 Install and maintain grease traps.
12.05 Install and maintain gas and oil separators.
12.06 Install and maintain sand and sediment interceptors.

13.0 DEMONSTRATE PROFICIENCY IN INSTALLING IRRIGATION SYSTEMS--The student will be able to:

13.01 Explain the theory and procedures of landscape and commercial irrigation systems.
13.02 Design, size and lay out a landscape and/or commercial irrigation system.
13.03 Select materials in accordance with given specifications.
13.04 Lay out a job on site.
13.05 Install distribution systems.
13.06 Install equipment and controls.
13.07 Test and inspect systems.

14.0 DEMONSTRATE PROFICIENCY IN INSTALLING ROOF DRAINS AND LEADERS--The student will be able to:

14.01 Explain the theory of roof drains and leaders.
14.02 Design, size and lay out systems.
14.03 Select materials in accordance with specifications.
14.04 Lay out a job on site.
14.05 Install distribution systems.
14.06 Install the roof drains and leaders.
14.07 Test and inspect systems.

15.0 DEMONSTRATE PROFICIENCY IN INSTALLING A BOOSTER SYSTEM--The student will be able to:

15.01 Explain the basic theory of the booster pump system.
15.02 Select equipment and materials in accordance with job

specifications.
15.03 Design, size, and lay out a booster pump system.
15.04 Lay out a job site.
15.05 Install distribution systems.
15.06 Install equipment controls.
15.07 Install safety devices.
15.08 Test, balance, and inspect the final booster system.
15.09 Balance and adjust controls.

16.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

16.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
16.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
16.03 Read and follow written and oral instructions.
16.04 Answer and ask questions coherently and concisely.
16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
16.06 Demonstrate appropriate telephone/communication skills.

17.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

17.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
17.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
17.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
17.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
17.05 Demonstrate an understanding of federal, state and local taxes and their computation.

18.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

18.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
18.02 Draw conclusions or make inferences from data.
18.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
18.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

19.01 Conduct a job search.
19.02 Secure information about a job.
19.03 Identify documents that may be required when applying for a job.
19.04 Complete a job application form correctly.
19.05 Demonstrate competence in job interview techniques.
19.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
19.07 Identify acceptable work habits.
19.08 Demonstrate knowledge of how to make job changes appropriately.
19.09 Demonstrate acceptable employee health habits.
19.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

20.01 Define entrepreneurship.
20.02 Describe the importance of entrepreneurship to the American economy.
20.03 List the advantages and disadvantages of business ownership.
20.04 Identify the risks involved in ownership of a business.
20.05 Identify the necessary personal characteristics of a successful entrepreneur.
20.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

CODE NUMBER: Secondary 8706000 Postsecondary ______

Florida CIP 0647.012600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___7-9 _x_9-12 ___Postsecondary Adult Vocational

___Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: APPLI REPR @ 7 G
GAS FITTER @ 7 G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as an electrical home appliance and power technician (85711648), gas stove servicer helper (637.684-010), air conditioning installer helper (637.687-101), or household appliance installer (827.661-010).

The content includes, but is not limited to skills to prepare individuals to repair, install and service major gas and electric consumer appliances as stoves, dryers, washers and dishwashers. Students who complete this program may gain additional training in this field by continuing their studies in major appliance and refrigeration repair at a postsecondary institution.

Listed below are the courses that comprise this program when offered at the secondary level:

8706010	Residential Appliance and Refrigeration Repair 1
8706020	Residential Appliance and Refrigeration Repair 2
8706030	Residential Appliance and Refrigeration Repair 3
8706040	Residential Appliance and Refrigeration Repair 4
8706050	Residential Appliance and Refrigeration Repair 5
8706060	Residential Appliance and Refrigeration Repair 6

II. **LABORATORY ACTIVITIES**: Laboratory activities are an integral part of this program including both gas and electric service in clothes dryers and ranges, basic refrigeration and tubing work.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply proper laboratory practices.
02. Apply electrical fundamentals.
03. Install, troubleshoot, and repair electric ranges.
04. Install, troubleshoot, and repair gas ranges.
05. Install, troubleshoot, and repair electric clothes dryers.
06. Install, troubleshoot, and repair gas clothes dryers.
07. Install, troubleshoot, and repair clothes washers.
08. Install, troubleshoot, and repair dishwashers.
09. Utilize fundamentals of refrigeration.
10. Work with tubing and fittings.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8706000

PROGRAM TITLE: Residential Appliance and Refrigeration Repair POSTSECONDARY NUMBER:

01.0 APPLY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Use industry accepted safety practices.
01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
01.03 Perform appropriate recordkeeping functions.
01.04 Explain and demonstrate the proper use and care of hand tools.
01.05 Explain and demonstrate the proper use and care of meters and test equipment.
01.06 Explain and demonstrate the proper use and care of power tools.

02.0 APPLY ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Explain electron theory.
02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
02.03 Explain Ohm's Law.
02.04 Measure resistance.
02.05 Measure voltage.
02.06 Measure amperage.
02.07 Measure wattage.
02.08 Explain and construct series circuits.
02.09 Explain and construct parallel circuits.
02.10 Explain and construct combination circuits.
02.11 Explain inductance and magnetism and their relationship to electric motors.
02.12 Describe how electric motors function.
02.13 Explain the function of capacitors and how to troubleshoot them.
02.14 Relays and switches.
02.15 Explain the function of capacitors and transformers in major appliances.
02.16 Explain the concept and rationale of motor protection.
02.17 Describe how a compressor functions.

03.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC RANGES--The student will be able to:

03.01 Install an electric range.
03.02 Describe the operation and application of components.
03.03 Read and interpret schematics and diagrams.
03.04 Troubleshoot clocks/timers.
03.05 Remove and replace clocks/timers.
03.06 Troubleshoot surface unit switches and components.
03.07 Remove and replace surface switches or components.
03.08 Troubleshoot oven thermostats and components.
03.09 Remove and replace oven thermostats or components.
03.10 Troubleshoot oven selector switches and components.
03.11 Remove and replace oven selector switches or components.
03.12 Troubleshoot surface units and components.
03.13 Remove and replace surface units or components.
03.14 Troubleshoot bake and broil elements.
03.15 Remove and replace bake and broil elements.
03.16 Troubleshoot mullion heaters.
03.17 Remove and replace mullion heater.
03.18 Troubleshoot time delay relays.

03.19 Remove and replace time delay relay.
03.20 Troubleshoot oven sensors and components.
03.21 Remove and replace oven sensor or component.
03.22 Troubleshoot door locks or components.
03.23 Remove and replace door lock or component.
03.24 Troubleshoot fans.
03.25 Remove and replace fan.
03.26 Troubleshoot gaskets and seals.
03.27 Remove and replace Gasket or seal.
03.28 Perform operational check.
03.29 Instruct consumer on use and care.

04.0 INSTALL, TROUBLESHOOT, AND REPAIR GAS RANGES--The student will be able to:

04.01 Install a gas range.
04.02 Identify components and their function.
04.03 Read and interpret schematics and diagrams.
04.04 Troubleshoot clocks/timers.
04.05 Remove and replace clocks/timers.
04.06 Troubleshoot oven thermostats.
04.07 Remove and replace oven thermostats.
04.08 Troubleshoot oven selector switches.
04.09 Remove and replace oven selector switches.
04.10 Troubleshoot self-clean relays.
04.11 Remove and replace self-clean relays.
04.12 Troubleshoot oven sensors.
04.13 Remove and replace oven sensor.
04.14 Troubleshoot door locks.
04.15 Remove and replace door lock.
04.16 Troubleshoot fans.
04.17 Remove and replace fan.
04.18 Troubleshoot gas valves for surface burners.
04.19 Remove and replace gas valve for surface burner.
04.20 Troubleshoot gas valve for oven.
04.21 Remove and replace gas valve for oven.
04.22 Troubleshoot electric igniters.
04.23 Remove and replace electric igniter.
04.24 Troubleshoot safety valves.
04.25 Remove and replace safety valve.
04.26 Troubleshoot pressure regulators.
04.27 Remove and replace pressure regulator.
04.28 Troubleshoot door seals/gaskets.
04.29 Remove and replace door seal/gasket.
04.30 Perform operational check.
04.31 Instruct consumer on use and care.

05.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC CLOTHES DRYER--The student will be able to:

05.01 Install an electric dryer.
05.02 Identify components and their function components.
05.03 Troubleshoot timers and components.
05.04 Remove and replace timer or component.
05.05 Troubleshoot drive motors and components.
05.06 Remove and replace drive motor or component.
05.07 Troubleshoot heating elements and components.
05.08 Remove and replace element or component.
05.09 Troubleshoot bearings and components.
05.10 Remove and replace bearing or component.
05.11 Troubleshoot belts and pulleys.
05.12 Remove and replace belt or pulley.

05.13 Troubleshoot rollers and glides.
05.14 Remove and replace roller or glides.
05.15 Troubleshoot filters.
05.16 Remove and replace filter.
05.17 Troubleshoot seals.
05.18 Remove and replace seals.
05.19 Troubleshoot push-to-start switch.
05.20 Remove and replace push-to-start switch.
05.21 Troubleshoot door switches.
05.22 Remove and replace door switch.
05.23 Troubleshoot selector switches.
05.24 Remove and replace selector switch.
05.25 Perform operational check.
05.25 Instruct consumer on use and care.

06.0 INSTALL, TROUBLESHOOT AND REPAIR GAS CLOTHES DRYERS--The student will be able to:

06.01 Install a gas dryer.
06.02 Identify components and their function.
06.03 Read and interpret schematics and diagrams.
06.04 Troubleshoot electric ignition components.
06.05 Remove and replace electric ignition components.
06.06 Troubleshoot timers and components.
06.07 Remove and replace timer or component.
06.08 Troubleshoot drive motors.
06.09 Remove and replace drive motor.
06.10 Troubleshoot gas burner.
06.11 Remove and replace gas burner.
06.12 Troubleshoot thermostats.
06.13 Remove and replace thermostat.
06.14 Troubleshoot gas valves.
06.15 Remove and replace gas valve.
06.16 Troubleshoot thermocouples.
06.17 Remove and replace thermocouple.
06.18 Troubleshoot flame switch.
06.19 Remove and replace flame switch.
06.20 Troubleshoot bearing assemblies and components.
06.21 Remove and replace bearing or component.
06.22 Troubleshoot belts and pulleys.
06.23 Remove and replace belt or pulley.
06.24 Troubleshoot rollers and glides.
06.25 Remove and replace roller or glide.
06.26 Troubleshoot seals.
06.27 Remove and replace seals.
06.28 Troubleshoot door switches.
06.29 Remove and replace door switch.
06.30 Troubleshoot selector switches.
06.31 Remove and replace selector switch.
06.32 Troubleshoot motor switches.
06.33 Remove and replace motor switch.
06.34 Perform operational check.
06.35 Instruct consumer on use and care.

07.0 INSTALL, TROUBLESHOOT AND REPAIR CLOTHES WASHERS--The student will be able to:

07.01 Install a clothes washer.
07.02 Identify components and their function.
07.03 Read and interpret schematics and diagrams.
07.04 Troubleshoot timers and components.
07.05 Remove and replace timer or component.

07.06 Troubleshoot selector switches.
07.07 Remove and replace selector switch.
07.08 Troubleshoot water level switches and components.
07.09 Remove and replace water level switch or component.
07.10 Troubleshoot water inlet valves and components.
07.11 Remove and replace water inlet valve or component.
07.12 Troubleshoot hoses.
07.13 Remove and replace hoses.
07.14 Troubleshoot water pumps and components.
07.15 Remove and replace water pump or component.
07.16 Troubleshoot filters.
07.17 Remove and replace filter.
07.18 Troubleshoot drive motors and components.
07.19 Remove and replace drive motor or component.
07.20 Troubleshoot belts and pulleys.
07.21 Remove and replace belt or pulley.
07.22 Troubleshoot transmissions and components.
07.23 Remove and replace transmission or component.
07.24 Troubleshoot bearings.
07.25 Remove and replace bearings.
07.26 Troubleshoot water and oil seals.
07.27 Remove and replace water and oil seals.
07.28 Troubleshoot clutches.
07.29 Remove and replace clutch.
07.30 Troubleshoot brakes.
07.31 Remove and replace brake.
07.32 Troubleshoot lid switches and components.
07.33 Remove and replace lid switch or component.
07.34 Perform operational check.
07.35 Instruct consumer on use and care.

08.0 INSTALL, TROUBLESHOOT, AND REPAIR DISHWASHERS--The student will be able to:

08.01 Install a dishwasher.
08.02 Identify components and their function.
08.03 Read and interpret schematics and diagrams.
08.04 Troubleshoot timers and components.
08.05 Remove and replace timer or component.
08.06 Troubleshoot selector switches.
08.07 Remove and replace selector switch.
08.08 Troubleshoot float switches.
08.09 Remove and replace float switch.
08.10 Troubleshoot door switches.
08.11 Remove and replace door switch.
08.12 Troubleshoot motors and components.
08.13 Remove and replace motor and component.
08.14 Troubleshoot heating elements.
08.15 Remove and replace heating element.
08.16 Troubleshoot relays.
08.17 Remove and replace relay.
08.18 Troubleshoot water valves and components.
08.19 Remove and replace water valve or component.
08.20 Troubleshoot hoses.
08.21 Remove and replace hoses.
08.22 Troubleshoot pumps and components.
08.23 Remove and replace pump or component.
08.24 Troubleshoot seals.
08.25 Remove and replace seals.
08.26 Troubleshoot dispensers and components.
08.27 Remove and replace dispenser or component.
08.28 Troubleshoot spray arms.

08.29 Remove and replace spray arm.
08.30 Troubleshoot blower motors.
08.31 Remove and replace blower motor.
08.32 Troubleshoot thermostats.
08.33 Remove and replace thermostat.
08.34 Perform operational check.
08.35 Instruct consumer on use and care.

09.0 UTILIZE THE FUNDAMENTALS OF REFRIGERATION--The student will be able to:

09.01 Explain commonly used terms.
09.02 Perform heat transfer, measuring and temperature conversions.
09.03 Perform pressure measuring and conversion calculations.
09.04 Explain the concept of state of matter.
09.05 Explain the differences in refrigerants and their uses.
09.06 Diagram and explain the functions of the components of basic refrigeration systems.
09.07 Remove, repair and replace compressors.
09.08 Remove, replace and service condensers, evaporators and driers.
09.09 Use metering devices to determine operating condition of a refrigeration system.
09.10 Troubleshoot and repair defective refrigeration systems.

10.0 WORK WITH TUBING AND FITTINGS--The student will be able to:

10.01 Identify types and sizes of tubing and fittings.
10.02 Measure, cut, flare, swage and bend tubing.
10.03 Soft solder with acetylene.
10.04 Braze with acetylene and oxyacetylene.
10.05 Fabricate replacement sections of tubing for appliances.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes,

chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 1

COURSE NUMBER: 8706010

COURSE DESCRIPTION:

This course is designed to present safety and first aid for the lab environment. Also the identification, use and care of hand and power tools will be presented. Brazing and soldering techniques, as well as working with tubing, will be presented.

01.0 APPLY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Use industry accepted safety practices.
01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
01.03 Perform appropriate recordkeeping functions.
01.04 Explain and demonstrate the proper use and care of hand tools.
01.05 Explain and demonstrate the proper use and care of meters and test equipment.
01.06 Explain and demonstrate the proper use and care of power tools.

10.0 WORK WITH TUBING AND FITTINGS--The student will be able to:

10.01 Identify types and sizes of tubing and fittings.
10.02 Measure, cut, flare, swage and bend tubing.
10.03 Soft solder with acetylene.
10.04 Braze with acetylene and oxyacetylene.
10.05 Fabricate replacement sections of tubing for appliances.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 2

COURSE NUMBER: 8706020

COURSE DESCRIPTION:

This course will teach basic concepts of electricity and electrical circuits, their component parts, and theory of operation including Ohm's law. Basic concepts of transformers, electric motors and capacitors will be presented.

02.0 APPLY ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Explain electron theory.
02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
02.03 Explain Ohm's Law.
02.04 Measure resistance.
02.05 Measure voltage.

02.06 Measure amperage.
02.07 Measure wattage.
02.08 Explain and construct series circuits.
02.09 Explain and construct parallel circuits.
02.10 Explain and construct combination circuits.
02.11 Explain inductance and magnetism and their relationship to electric motors.
02.12 Describe how electric motors function.
02.13 Explain the function of capacitors and how to troubleshoot them.
02.14 Relays and switches.
02.15 Explain the function of capacitors and transformers in major appliances.
02.16 Explain the concept and rationale of motor protection.
02.17 Describe how a compressor functions.

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STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial   COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair   PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 3   COURSE NUMBER: 8706030

COURSE DESCRIPTION:

This course teaches the skills necessary to install, troubleshoot and repair, electric ranges and clothes dryers. Techniques to instruct the consumer on the proper operation of these appliances will be presented.

03.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC RANGES--The student will be able to:

03.01 Install an electric range.
03.02 Describe the operation and application of components.
03.03 Read and interpret schematics and diagrams.
03.04 Troubleshoot clocks/timers.
03.05 Remove and replace clocks/timers.
03.06 Troubleshoot surface unit switches and components.
03.07 Remove and replace surface switches or components.
03.08 Troubleshoot oven thermostats and components.
03.09 Remove and replace oven thermostats or components.
03.10 Troubleshoot oven selector switches and components.
03.11 Remove and replace oven selector switches or components.
03.12 Troubleshoot surface units and components.
03.13 Remove and replace surface units or components.
03.14 Troubleshoot bake and broil elements.
03.15 Remove and replace bake and broil elements.
03.16 Troubleshoot mullion heaters.
03.17 Remove and replace mullion heater.
03.18 Troubleshoot time delay relays.
03.19 Remove and replace time delay relay.
03.20 Troubleshoot oven sensors and components.
03.21 Remove and replace oven sensor or component.
03.22 Troubleshoot door locks or components.
03.23 Remove and replace door lock or component.
03.24 Troubleshoot fans.
03.25 Remove and replace fan.
03.26 Troubleshoot gaskets and seals.

03.27 Remove and replace Gasket or seal.
03.28 Perform operational check.
03.29 Instruct consumer on use and care.

05.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC CLOTHES DRYER--The student will be able to:

05.01 Install an electric dryer.
05.02 Identify components and their function components.
05.03 Troubleshoot timers and components.
05.04 Remove and replace timer or component.
05.05 Troubleshoot drive motors and components.
05.06 Remove and replace drive motor or component.
05.07 Troubleshoot heating elements and components.
05.08 Remove and replace element or component.
05.09 Troubleshoot bearings and components.
05.10 Remove and replace bearing or component.
05.11 Troubleshoot belts and pulleys.
05.12 Remove and replace belt or pulley.
05.13 Troubleshoot rollers and glides.
05.14 Remove and replace roller or glides.
05.15 Troubleshoot filters.
05.16 Remove and replace filter.
05.17 Troubleshoot seals.
05.18 Remove and replace seals.
05.19 Troubleshoot push-to-start switch.
05.20 Remove and replace push-to-start switch.
05.21 Troubleshoot door switches.
05.22 Remove and replace door switch.
05.23 Troubleshoot selector switches.
05.24 Remove and replace selector switch.
05.25 Perform operational check.
05.26 Instruct consumer on use and care.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Appliance and Refrigeration Repair	PROGRAM NUMBER:	8706000
COURSE TITLE:	Residential Appliance and Refrigeration Repair 4	COURSE NUMBER:	8706040

COURSE DESCRIPTION:

This course will include the hands-on performance of installation, troubleshooting and repair of residential clothes washers, refrigerators and dishwashers.

07.0 INSTALL, TROUBLESHOOT AND REPAIR CLOTHES WASHERS--The student will be able to:

07.01 Install a clothes washer.
07.02 Identify components and their function.
07.03 Read and interpret schematics and diagrams.
07.04 Troubleshoot timers and components.
07.05 Remove and replace timer or component.
07.06 Troubleshoot selector switches.
07.07 Remove and replace selector switch.

07.08 Troubleshoot water level switches and components.
07.09 Remove and replace water level switch or component.
07.10 Troubleshoot water inlet valves and components.
07.11 Remove and replace water inlet valve or component.
07.12 Troubleshoot hoses.
07.13 Remove and replace hoses.
07.14 Troubleshoot water pumps and components.
07.15 Remove and replace water pump or component.
07.16 Troubleshoot filters.
07.17 Remove and replace filter.
07.18 Troubleshoot drive motors and components.
07.19 Remove and replace drive motor or component.
07.20 Troubleshoot belts and pulleys.
07.21 Remove and replace belt or pulley.
07.22 Troubleshoot transmissions and components.
07.23 Remove and replace transmission or component.
07.24 Troubleshoot bearings.
07.25 Remove and replace bearings.
07.26 Troubleshoot water and oil seals.
07.27 Remove and replace water and oil seals.
07.28 Troubleshoot clutches.
07.29 Remove and replace clutch.
07.30 Troubleshoot brakes.
07.31 Remove and replace brake.
07.32 Troubleshoot lid switches and components.
07.33 Remove and replace lid switch or component.
07.34 Perform operational check.
07.35 Instruct consumer on use and care.

08.0 INSTALL, TROUBLESHOOT, AND REPAIR DISHWASHERS--The student will be able to:

08.01 Install a dishwasher.
08.02 Identify components and their function.
08.03 Read and interpret schematics and diagrams.
08.04 Troubleshoot timers and components.
08.05 Remove and replace timer or component.
08.06 Troubleshoot selector switches.
08.07 Remove and replace selector switch.
08.08 Troubleshoot float switches.
08.09 Remove and replace float switch.
08.10 Troubleshoot door switches.
08.11 Remove and replace door switch.
08.12 Troubleshoot motors and components.
08.13 Remove and replace motor and component.
08.14 Troubleshoot heating elements.
08.15 Remove and replace heating element.
08.16 Troubleshoot relays.
08.17 Remove and replace relay.
08.18 Troubleshoot water valves and components.
08.19 Remove and replace water valve or component.
08.20 Troubleshoot hoses.
08.21 Remove and replace hoses.
08.22 Troubleshoot pumps and components.
08.23 Remove and replace pump or component.
08.24 Troubleshoot seals.
08.25 Remove and replace seals.
08.26 Troubleshoot dispensers and components.
08.27 Remove and replace dispenser or component.
08.28 Troubleshoot spray arms.
08.29 Remove and replace spray arm.
08.30 Troubleshoot blower motors.

08.31 Remove and replace blower motor.
08.32 Troubleshoot thermostats.
08.33 Remove and replace thermostat.
08.34 Perform operational check.
08.35 Instruct consumer on use and care.

09.0 UTILIZE THE FUNDAMENTALS OF REFRIGERATION--The student will be able to:

09.01 Explain commonly used terms.
09.02 Perform heat transfer, measuring and temperature conversions.
09.03 Perform pressure measuring and conversion calculations.
09.04 Explain the concept of state of matter.
09.05 Explain the differences in refrigerants and their uses.
09.06 Diagram and explain the functions of the components of basic refrigeration systems.
09.07 Remove, repair and replace compressors.
09.08 Remove, replace and service condensers, evaporators and driers.
09.09 Use metering devices to determine operating condition of a refrigeration system.
09.10 Troubleshoot and repair defective refrigeration systems.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Appliance and Refrigeration Repair	PROGRAM NUMBER:	8706000
COURSE TITLE:	Residential Appliance and Refrigeration Repair 5	COURSE NUMBER:	8706050

COURSE DESCRIPTION:

This course is designed for component identification, troubleshooting and repair of residential gas ranges and clothes dryers.

04.0 INSTALL, TROUBLESHOOT, AND REPAIR GAS RANGES--The student will be able to:

04.01 Install a gas range.
04.02 Identify components and their function.
04.03 Read and interpret schematics and diagrams.
04.04 Troubleshoot clocks/timers.
04.05 Remove and replace clocks/timers.
04.06 Troubleshoot oven thermostats.
04.07 Remove and replace oven thermostats.
04.08 Troubleshoot oven selector switches.
04.09 Remove and replace oven selector switches.
04.10 Troubleshoot self-clean relays.
04.11 Remove and replace self-clean relays.
04.12 Troubleshoot oven sensors.
04.13 Remove and replace oven sensor.
04.14 Troubleshoot door locks.
04.15 Remove and replace door lock.
04.16 Troubleshoot fans.
04.17 Remove and replace fan.
04.18 Troubleshoot gas valves for surface burners.
04.19 Remove and replace gas valve for surface burner.
04.20 Troubleshoot gas valve for oven.
04.21 Remove and replace gas valve for oven.

04.22 Troubleshoot electric igniters.
04.23 Remove and replace electric igniter.
04.24 Troubleshoot safety valves.
04.25 Remove and replace safety valve.
04.26 Troubleshoot pressure regulators.
04.27 Remove and replace pressure regulator.
04.28 Troubleshoot door seals/gaskets.
04.29 Remove and replace door seal/gasket.
04.30 Perform operational check.
04.31 Instruct consumer on use and care.

06.0 INSTALL, TROUBLESHOOT AND REPAIR GAS CLOTHES DRYERS--The student will be able to:

06.01 Install a gas dryer.
06.02 Identify components and their function.
06.03 Read and interpret schematics and diagrams.
06.04 Troubleshoot electric ignition components.
06.05 Remove and replace electric ignition components.
06.06 Troubleshoot timers and components.
06.07 Remove and replace timer or component.
06.08 Troubleshoot drive motors.
06.09 Remove and replace drive motor.
06.10 Troubleshoot gas burner.
06.11 Remove and replace gas burner.
06.12 Troubleshoot thermostats.
06.13 Remove and replace thermostat.
06.14 Troubleshoot gas valves.
06.15 Remove and replace gas valve.
06.16 Troubleshoot thermocouples.
06.17 Remove and replace thermocouple.
06.18 Troubleshoot flame switch.
06.19 Remove and replace flame switch.
06.20 Troubleshoot bearing assemblies and components.
06.21 Remove and replace bearing or component.
06.22 Troubleshoot belts and pulleys.
06.23 Remove and replace belt or pulley.
06.24 Troubleshoot rollers and glides.
06.25 Remove and replace roller or glide.
06.26 Troubleshoot seals.
06.27 Remove and replace seals.
06.28 Troubleshoot door switches.
06.29 Remove and replace door switch.
06.30 Troubleshoot selector switches.
06.31 Remove and replace selector switch.
06.32 Troubleshoot motor switches.
06.33 Remove and replace motor switch.
06.34 Perform operational check.
06.35 Instruct consumer on use and care.

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 6

COURSE NUMBER: 8706060

COURSE DESCRIPTION:

This course is designed to instruct the student in the preparation of job applications and resumes. Also to enhance the student in additional lab activities as selected by the instructor.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 11.03 Read and follow written and oral instructions.
- 11.04 Answer and ask questions coherently and concisely.
- 11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

- 12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
- 12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
- 12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
- 12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

- 13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
- 13.02 Draw conclusions or make inferences from data.
- 13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
- 13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 14.01 Conduct a job search.
- 14.02 Secure information about a job.
- 14.03 Identify documents which may be required when applying for a job interview.
- 14.04 Complete a job application form correctly.
- 14.05 Demonstrate competence in job interview techniques.
- 14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 14.07 Identify acceptable work habits.
- 14.08 Demonstrate knowledge of how to make job changes appropriately.
- 14.09 Demonstrate acceptable employee health habits.
- 14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be

able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential Electric Wiring

CODE NUMBER: Secondary 8727100　　Postsecondary ______

Florida CIP 0646.031200

SECONDARY SCHOOL CREDITS 6　　COLLEGE CREDITS ______　　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9　x 9-12　____ Postsecondary Adult Vocational

______ Postsecondary Vocational　x Other 30,31

CERTIFICATION COVERAGE: ELECTRICAL @ 7 G ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians (87202549) and residential electrician helpers (829.684-022). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: installation, maintenance and repair of residential and commercial electrical systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses which comprise this program when offered at the secondary level:

8727110	Residential Electric Wiring 1
8727120	Residential Electric Wiring 2
8727130	Residential Electric Wiring 3
8727140	Residential Electric Wiring 4
8727150	Residential Electric Wiring 5
8727160	Residential Electric Wiring 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: installation, maintenance, repair and modification of residential and commercial electrical systems and components in accordance with existing codes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform basic electrical laboratory safety and calculation skills.
02. Demonstrate basic electrical circuit skills.
03. Demonstrate direct current (DC) circuit skills.
04. Demonstrate alternating current (AC) circuit skills.
05. Demonstrate residential wiring skills.
06. Demonstrate appropriate communication skills.
07. Demonstrate appropriate math skills.
08. Demonstrate appropriate understanding of basic science.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8727100

PROGRAM TITLE: Residential Electric Wiring POSTSECONDARY NUMBER:

1.0 PERFORM BASIC ELECTRICAL LABORATORY SAFETY AND CALCULATION SKILLS--The student will be able to:

01.01 Apply lab policies and procedures for safety.
01.02 Operate lab safety devices.
01.03 Demonstrate personal safety procedures.
01.04 Solve basic math problems related to electrical work.
01.05 Drill holes in metal for electrical wiring.
01.06 Measure voltage, amperage and resistance using volt-ohm meter (VOM) and digital volt-Ohm meter (DVM).
01.07 Describe various ways that electricity is produced.
01.08 Comprehend electrical and electrician's codes and terminology.
01.09 Relate electricity to the nature of matter.

02.0 DEMONSTRATE PASIC ELECTRICAL CIRCUIT SKILLS--The student will be able to:

02.01 Analyze a series, series-parallel and parallel circuit.
02.02 Construct a series, series-parallel and parallel circuit.
02.03 Troubleshoot a series, series-parallel and parallel circuit.
02.04 Draw each type circuit and calculate the circuit values.

03.0 DEMONSTRATE DIRECT CURRENT (DC) CIRCUIT SKILLS--The student will be able to:

03.01 Define power and energy.
03.02 Apply and relate Ohm's Law.
03.03 Measure conductance and resistance of conductors and insulators.
03.04 Define magnetic properties of circuits and devices.
03.05 Define the principles of electromagnetism.

04.0 DEMONSTRATE ALTERNATING CURRENT (AC) CIRCUIT SKILLS--The student will be able to:

04.01 Identify physical and electrical characteristics of capacitors and inductors.
04.02 Analyze and measure inductive reactance (RL) and reactive capacitance (RC) time constants.
04.03 Discuss motor theory and operation
04.04 Discuss generator theory and operation.
04.05 Construct a parallel and series RL circuit.
04.06 Construct a parallel and series RC circuit.
04.07 Construct a parallel and series inductive reactance capacitance (RLC) circuit.
04.08 Setup and utilize a watt-hour meter.
04.09 Measure voltage and current in circuits with transformers.

05.0 DEMONSTRATE RESIDENTIAL WIRING SKILLS--The student will be able to:

05.01 Identify tools and material to complete a job.
05.02 Select wire appropriate for job requirements.
05.03 Apply regulations for placement of electrical devices.
05.04 Install conductors and cable.
05.05 Install standard outlets and switch boxes.
05.06 Install cards on major appliances (whips).

05.07 Interpret electrical wiring symbols.
05.08 Install switches, receptacles and dimmers.
05.09 Operate and maintain power generators.
05.10 Operate and maintain power tools.
05.11 Identify residential wiring requirements based on floor plan.
05.12 Identify residential wiring installation specifications.
05.13 Draw a residential wiring plan.
05.14 Install a single-pole switched lighting circuit.
05.15 Install a three-way switched lighting circuit.
05.16 Install a four-way combination circuit.
05.17 Connect a recessed lighting fixture.
05.18 Connect a fluorescent lighting fixture.
05.19 Connect a surface lighting fixture.
05.20 Install and wire a duplex receptacle outlet circuit.
05.21 Install and wire a split circuit duplex receptacle outlet circuit.
05.22 Install and wire a special purpose receptacle outlet circuit.
05.23 Install and wire a space heating circuit.
05.24 Install and wire a low voltage signal system.
05.25 Install conduit systems.
05.26 Comply with National Electrical Code (NEC) requirements for residential wiring.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other person.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make appropriate job changes.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Residential Electric Wiring
PROGRAM NUMBER: 8727100
COURSE TITLE: Residential Electric Wiring 1
COURSE NUMBER: 8727110

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for basic electrical laboratory safety and calculation skills.

1.0 PERFORM BASIC ELECTRICAL LABORATORY SAFETY AND CALCULATION SKILLS--The student will be able to:

01.01 Apply lab policies and procedures for safety.
01.02 Operate lab safety devices.
01.03 Demonstrate personal safety procedures.
01.04 Solve basic math problems related to electrical work.
01.05 Drill holes in metal for electrical wiring.
01.06 Measure voltage, amperage and resistance using volt-ohm meter (VOM) and digital volt-Ohm meter (DVM).
01.07 Describe various ways that electricity is produced.
01.08 Comprehend electrical and electrician's codes and terminology.
01.09 Relate electricity to the nature of matter.

07.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

07.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

08.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
08.02 Draw conclusions or make inferences from data.
08.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
08.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Residential Electric Wiring
PROGRAM NUMBER: 8727100
COURSE TITLE: Residential Electric Wiring 2
COURSE NUMBER: 8727120

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for basic electrical circuit skills.

02.0 DEMONSTRATE BASIC ELECTRICAL CIRCUIT SKILLS--The student will be able to:

- 02.01 Analyze a series, series-parallel and parallel circuit.
- 02.02 Construct a series, series-parallel and parallel circuit.
- 02.03 Troubleshoot a series, series-parallel and parallel circuit.
- 02.04 Draw each type circuit and calculate the circuit values.

06.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

- 06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
- 06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
- 06.03 Read and follow written and oral instructions.
- 06.04 Answer and ask questions coherently and concisely.
- 06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 06.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 3	COURSE NUMBER:	8727130

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for demonstrating proficiency in DC circuits skills.

03.0 DEMONSTRATE DIRECT CURRENT (DC) CIRCUIT SKILLS--The student will be able to:

- 03.01 Define power and energy.
- 03.02 Apply and relate Ohm's Law.
- 03.03 Measure conductance and resistance of conductors and insulators.
- 03.04 Define magnetic properties of circuits and devices.
- 03.05 Define the principles of electromagnetism.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 4	COURSE NUMBER:	8727140

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for demonstrating proficiency in AC circuits.

04.0 DEMONSTRATE ALTERNATING CURRENT (AC) CIRCUIT SKILLS--The student will be able to:

04.01 Identify physical and electrical characteristics of capacitors and inductors.
04.02 Analyze and measure inductive reactance (RL) and reactive capacitance (RC) time constants.
04.03 Discuss motor theory and operation
04.04 Discuss generator theory and operation.
04.05 Construct a parallel and series RL circuit.
04.06 Construct a parallel and series RC circuit.
04.07 Construct a parallel and series inductive reactance capacitance (RLC) circuit.
04.08 Setup and utilize a watt-hour meter.
04.09 Measure voltage and current in circuits with transformers.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 5	COURSE NUMBER:	8727150

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for demonstrating proficiency in residential wiring skills dealing with the installation of electrical wiring for outlets, lights and switches.

05.0 DEMONSTRATE RESIDENTIAL WIRING SKILLS--The student will be able to:

05.01 Identify tools and material to complete a job.
05.02 Select wire appropriate for job requirements.
05.03 Apply regulations for placement of electrical devices.
05.04 Install conductors and cable.
05.05 Install standard outlets and switch boxes.
05.06 Install cards on major appliances (whips).
05.07 Interpret electrical wiring symbols.
05.08 Install switches, receptacles and dimmers.
05.09 Operate and maintain power generators.
05.10 Operate and maintain power tools.
05.11 Identify residential wiring requirements based on floor plan.
05.12 Identify residential wiring installation specifications.
05.13 Draw a residential wiring plan.
05.14 Install a single-pole switched lighting circuit.
05.15 Install a three-way switched lighting circuit.
05.16 Install a four-way combination circuit.
05.17 Connect a recessed lighting fixture.
05.18 Connect a fluorescent lighting fixture.
05.19 Connect a surface lighting fixture.
05.20 Install and wire a duplex receptacle outlet circuit.
05.21 Install and wire a split circuit duplex receptacle outlet circuit.
05.22 Install and wire a special purpose receptacle outlet circuit.

05.23 Install and wire a space heating circuit.
05.24 Install and wire a low voltage signal system.
05.25 Install conduit systems.
05.26 Comply with National Electrical Code (NEC) requirements for residential wiring.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 6	COURSE NUMBER:	8727160

COURSE DESCRIPTION:

This course is designed to provide instruction in different procedures for demonstrating employability skills and an understanding of entrepreneurship.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other person.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.
09.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July 1993

PROGRAM TITLE: Residential Heat and Air Conditioning

CODE NUMBER: Secondary Postsecondary I470251

Florida CIP 0647.025100

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational ___ Other 30-31

CERTIFICATION COVERAGE: AC HEAT ME @ 7 G REFRG MECH @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as residential heat and air conditioning installer-servicers (637.261-010), or to provide supplemental training for persons previously or currently employed in these occupations. Individuals completing this program will be qualified to work in the industry as residential heat and air conditioning technicians.

The course content includes, but is not limited to, planning installation, testing and servicing of air conditioning and heating systems and components; servicing, installation and troubleshooting electrical and mechanical components; testing, diagramming and solving problems in air conditioning and heating equipment; record keeping; supervisory skills; use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use of specialized tools and equipment, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocation programs is: Mathematics 10.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: A training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a 'transfer value' assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The average length of this program for the typical student is 1800 hours when content from the Florida common core air conditioning refrigeration and heating (Air Conditioning, Refrigeration and Heating Mechanics) is included.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate a basic understanding of refrigeration.
02. Demonstrate proficiency in refrigeration cycle/diagrams.
03. Demonstrate a knowledge of heating-servicing and testing equipment.
04. Demonstrate proficiency in refrigeration-piping materials and fabrication.
05. Demonstrate proficiency in refrigeration pipe sizing and troubleshooting.
06. Demonstrate proficiency in electrical components/motors.
07. Demonstrate proficiency in solid state electronics.
08. Demonstrate proficiency in valves and regulators.
09. Demonstrate proficiency in sensing devices/heating controls.
10. Demonstrate proficiency in commercial and engineered control systems.
11. Demonstrate proficiency in psychrometrics.
12. Demonstrate proficiency in compressors.
13. Demonstrate an understanding of central station systems.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: ________

PROGRAM TITLE: Residential Heat and Air Conditioning

POSTSECONDARY NUMBER: I470251

01.0 DEMONSTRATE A BASIC UNDERSTANDING OF REFRIGERATION--The student will be able to:

01.01 Demonstrate a basic understanding and appreciation of air conditioning and its impact on society.

02.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION CYCLE/DIAGRAMS--The student will be able to:

02.01 Identify all zones and lines on the pressure enthalpy (PH) chart.
02.02 State the unit of measurement for H (Btu/lb) on the pressure enthalpy (PH) chart.
02.03 Define enthalpy and entropy.
02.04 Diagram simple cycle using the pressure enthalpy (PH) chart.
02.05 Show arrows for direction of cycle on the (PH) chart.

03.0 DEMONSTRATE A KNOWLEDGE OF HEATING-SERVICING AND TESTING EQUIPMENT--The student will be able to:

03.01 Use a draft gauge.
03.02 Measure gas pressures with a U-tube manometer.
03.03 Use a sling psychrometer.
03.04 Use a millivolt meter.
03.05 Use oil furnace test equipment.

04.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION-PIPING MATERIALS AND FABRICATION--The student will be able to:

04.01 Describe procedures used to protect valves/fittings from heat damage.

05.0 DEMONSTRATE PROFICIENCY IN REFRIGERATION-PIPE SIZING AND TROUBLESHOOTING--The student will be able to:

05.01 Explain pressure drop.
05.02 Size piping.
05.03 Size hot gas lines for heat recovery.

06.0 DEMONSTRATE PROFICIENCY IN ELECTRICAL COMPONENTS/MOTORS--The student will be able to:

06.01 Define and explain the use or function of zone dampers and actuators.
06.02 Explain the operation and application of shaded pole.
06.03 Describe lubrication methods for motors.
06.04 Describe the operation of time delay relays.

07.0 DEMONSTRATE PROFICIENCY IN SOLID STATE ELECTRONICS--The student will be able to:

07.01 Explain basic solid state circuits.
07.02 Identify, test, and replace circuit boards.

08.0 DEMONSTRATE PROFICIENCY IN VALVES AND REGULATORS--The student will be

able to:

08.01 Identify low voltage type gas valves.
08.02 Identify line voltage type gas valves.
08.03 Explain the operation of solenoid valves.
08.04 Determine application of gas valves.
08.05 Size gas valves.

09.0 DEMONSTRATE PROFICIENCY IN SENSING DEVICES/HEATING CONTROLS--The student will be able to:

09.01 Install, set, and test a fan limit control.
09.02 Install, set, and test a high limit.
09.03 Connect and test a humidistat.
09.04 Connect and test a control circuit for an electronic air cleaner.

10.0 DEMONSTRATE PROFICIENCY IN COMMERCIAL AND ENGINEERED CONTROL SYSTEMS--The student will be able to:

10.01 Construct a schematic diagram using all components necessary to safely operate an air conditioner.
10.02 Construct a schematic diagram using all components necessary to safely operate a heat pump.
10.03 Construct a schematic diagram using all components necessary to safely operate an oil furnace.
10.04 Construct a schematic diagram using all components necessary to safely operate a gas furnace.
10.05 Construct a schematic diagram using all components necessary to safely operate an electric furnace.
10.06 Program a programmable thermostat for heating, cooling, and heat pump operation including set up and set back.

11.0 DEMONSTRATE PROFICIENCY IN PSYCHROMETRICS--The student will be able to:

11.01 Identify the dry bulb line (DB) on the chart.
11.02 Identify the wet bulb line (WB) on the chart.
11.03 Identify dew point.
11.04 Identify relative humidity.
11.05 List basic information found on a psychrometric chart.
11.06 Determine relative humidity when only dry bulb and wet bulb temperatures are known.
11.07 Determine how outside air should be conditioned to provide a comfortable humidity and temperature combination in winter heating and also in summer cooling.
11.08 Determine the relative humidity of a conditioned space and an outdoor space.
11.09 Determine the wet bulb temperature of the air inside a duct.
11.10 Identify the components of a sling psychrometer.
11.01 Arrange, in order, the steps in operating a sling psychrometer.

12.0 DEMONSTRATE PROFICIENCY IN COMPRESSORS--The student will be able to:

12.01 Describe lubrication methods for compressors.

13.0 DEMONSTRATE AN UNDERSTANDING OF CENTRAL STATION SYSTEMS--The student will be able to:

13.01 Identify and explain air handlers.
13.02 Size air handling equipment components.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential Plumbing

CODE NUMBER: Secondary 8721700 Postsecondary ______

Florida CIP 0646.052300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G PLUMBIN @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a plumber (87502560), pipefitter (862.381-010). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: use of tools and equipment; blueprint reading; and the assembly, installation and repair of pipes, fittings and fixtures of residential heating, water and drainage systems according to specifications and plumbing codes.

The course content should also include skills training in communication, leadership, human relations and employability skills; safe, efficient work practices will be stressed during all phases of instruction.

Listed below are the courses that comprise this program when offered at the secondary level:

8721710	Residential Plumbing 1
8721720	Residential Plumbing 2
8721730	Residential Plumbing 3
8721740	Residential Plumbing 4
8721750	Residential Plumbing 5
8721760	Residential Plumbing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: planning, layout, and installation of residential plumbing systems including water supply, sewer, drain, waste, and vent systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Students completing this program may develop additional skills by enrolling in a residential and commercial plumbing program in a postsecondary school.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing basic plumbing skills.
02. Demonstrate proficiency in joining pipe.
03. Demonstrate proficiency in reading and interpreting blueprints and specifications.
04. Demonstrate proficiency laying out a job.
05. Demonstrate proficiency in installing first rough (underground).
06. Demonstrate proficiency in installing second rough (first floor and above.)
07. Demonstrate proficiency in trimming out plumbing.
08. Demonstrate proficiency in repairing, servicing and maintaining plumbing systems.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: 8721700

PROGRAM TITLE: Residential Plumbing

POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of plumbing.
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify plumbing fixtures and appliances.
01.09 Read and interpret and comply with manufacturers' schematics and specifications.
01.10 Find information in technical literature.
01.11 Give reports orally and in writing.
01.12 Listen to and comply with oral and written instructions.
01.13 Demonstrate proper care and maintenance of hand tools.
01.14 Demonstrate proper care and maintenance of power tools.

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Join plastic pipe using the adapter solvent cement method.
02.02 Cut steel pipe with a one wheel steel pipe cutter.
02.03 Cut steel pipe with a four-wheel steel pipe cutter.
02.04 Join plastic pipe to steel pipe.
02.05 Thread steel pipe with an adjustable die stock.
02.06 Thread steel pipe with a nonadjustable die stock.
02.07 Thread steel pipe with a power driven vise stand.
02.08 Cut copper tubing or pipe with a hacksaw.
02.09 Cut copper tubing or pipe with a tubing cutter.
02.10 Bend copper tubing or pipe with a spring bender.
02.11 Join copper tubing or pipe to copper tubing or pipe.
02.12 Join copper tubing to brass pipe.
02.13 Join copper tubing with a compressed connector.
02.14 Join copper tubing to steel pipe.
02.15 Join copper tubing or pipe to plastic pipe using the sweat method.
02.16 Join copper tubing or pipe to plastic pipe.
02.17 Cut cast iron soil pipe with a snap type chain cutter.
02.18 Join cast iron soil pipe with a hubless or band clamp coupling.

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's scale
03.03 Read and interpret a six foot rule.
03.04 Recognize and identify basic plumbing symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select fixtures.

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:
04.01 Determine a materials list.
04.02 Select material specifications.

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND)--The

student will be able to:

05.01 Lay out a job on site.
05.02 Install building drain, waste and vent systems.
05.03 Install distribution systems.
05.04 Install water service.
05.05 Install building sewer/septic tanks and /or approved sewer systems.
05.06 Test the first rough.

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site.
06.02 Install hangers and supports.
06.03 Install building drain, waste and vent systems.
06.04 Install water distribution systems.
06.05 Test the second rough.

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to.

07.01 Distribute and place fixtures and appliances.
07.02 Install and trim out fixtures.
07.03 Install closet flanges.
07.04 Install speed stops on water pipes.
07.05 Trim out a lavatory.
07.06 Trim out water closets.
07.07 Trim out bath tubs.
07.08 Trim out showers.
07.09 Trim out kitchen sinks.
07.10 Trim out washing machine drains and piping.
07.11 Install garbage disposals.
07.12 Hook up ice makers.
07.13 Install and trim out water heaters.
07.14 Install and hook up dishwashers.
07.15 Test and inspect the final installation.

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING, PLUMBING SYSTEMS--The student will be able to:

08.01 Troubleshoot and diagnose systems.
08.02 Repair sewer mains.
08.03 Repair water mains.
08.04 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers and trip levers.
08.05 Repair leaks in traps.
08.06 Repair leaks in faucets.
08.07 Install sink strainers.
08.08 Install heater elements.
08.09 Replace or repair fixture water supply pipes.
08.10 Reseal toilets to flanges.
08.11 Test and inspect repaired systems.
08.12 Explain the nature of the problem(s), remedial action(s) needed and advise the customer on preventive maintenance.
08.13 Prepare a job ticket.
08.14 Price a job and write the invoice.
08.15 Collect for services rendered.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:
09.01 Write logical and understandable statements, or phrases, to

accurately fill out forms/invoices commonly used in business and industry.

09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 1 COURSE NUMBER: 8721710

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing residential plumbing skills, and demonstrating employability skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures.
01.02 Explain the basic theory and principles of plumbing.
01.03 Identify and use hand tools.
01.04 Identify equipment and safety hazards.
01.05 Apply safety procedures.
01.06 Identify pipe fittings.
01.07 Identify pipe joining methods.
01.08 Identify plumbing fixtures and appliances.
01.09 Read and interpret and comply with manufacturers' schematics and specifications.
01.10 Find information in technical literature.
01.11 Give reports orally and in writing.
01.12 Listen to and comply with oral and written instructions.
01.13 Demonstrate proper care and maintenance of hand tools.
01.14 Demonstrate proper care and maintenance of power tools.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing
PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 2
COURSE NUMBER: 8721720

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic procedures for joining pipe.

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Join plastic pipe using the adapter solvent cement method.
02.02 Cut steel pipe with a one wheel steel pipe cutter.
02.03 Cut steel pipe with a four-wheel steel pipe cutter.
02.04 Join plastic pipe to steel pipe.
02.05 Thread steel pipe with an adjustable die stock.
02.06 Thread steel pipe with a nonadjustable die stock.
02.07 Thread steel pipe with a power driven vise stand.
02.08 Cut copper tubing or pipe with a hacksaw.
02.09 Cut copper tubing or pipe with a tubing cutter.
02.10 Bend copper tubing or pipe with a spring bender.
02.11 Join copper tubing or pipe to copper tubing or pipe.
02.12 Join copper tubing to brass pipe.
02.13 Join copper tubing with a compressed connector.
02.14 Join copper tubing to steel pipe.
02.15 Join copper tubing or pipe to plastic pipe using the seat method.
02.16 Join copper tubing or pipe to plastic pipe.
02.17 Cut cast iron soil pipe with a snap type chain cutter.
02.18 Join cast iron soil pipe with a hubless or band clamp coupling.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 3 COURSE NUMBER: 8721730

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reading and interpreting blueprints and specifications and laying out a job.

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills.
03.02 Read and interpret an architect's scale
03.03 Read and interpret a six foot rule.
03.04 Recognize and identify basic plumbing symbols.
03.05 Explain the basic theory and principles of isometrics.
03.06 Select fixtures.

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:

04.01 Determine a materials list.
04.02 Select material specifications.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 4 COURSE NUMBER: 8721740

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for installing a first rough (underground) and a second (first floor and above).

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND)--The student will be able to:

05.01 Lay out a job on site.
05.02 Install building drain, waste and vent systems.
05.03 Install distribution systems.
05.04 Install water service.
05.05 Install building sewer/septic tanks and /or approved sewer systems.
05.06 Test the first rough.

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site.
06.02 Install hangers and supports.
06.03 Install building drain, waste and vent systems.
06.04 Install water distribution systems.
06.05 Test the second rough.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 5 COURSE NUMBER: 8721750

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for trimming out plumbing.

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to:

07.01 Distribute and place fixtures and appliances.
07.02 Install and trim out fixtures.
07.03 Install closet flanges.
07.04 Install speed stops on water pipes.
07.05 Trim out a lavatory.
07.06 Trim out water closets.
07.07 Trim out bath tubs.
07.08 Trim out showers.
07.09 Trim out kitchen sinks.
07.10 Trim out washing machine drains and piping.
07.11 Install garbage disposals.
07.12 Hook up ice makers.
07.13 Install and trim out water heaters.
07.14 Install and hook up dishwashers.
07.15 Test and inspect the final installation.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 6 COURSE NUMBER: 8721760

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing, servicing, and maintaining plumbing systems.

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING, PLUMBING SYSTEMS--The student will be able to:

08.01 Troubleshoot and diagnose systems.
08.02 Repair sewer mains.
08.03 Repair water mains.
08.04 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers and trip levers.
08.05 Repair leaks in traps.
08.06 Repair leaks in faucets.
08.07 Install sink strainers.
08.08 Install heater elements.
08.09 Replace or repair fixture water supply pipes.
08.10 Reseal toilets to flanges.
08.11 Test and inspect repaired systems.

08.12 Explain the nature of the problem(s), remedial action(s) needed and advise the customer on preventive maintenance.
08.13 Prepare a job ticket.
08.14 Price a job and write the invoice.
08.15 Collect for services rendered.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Residential Trim Carpentry

CODE NUMBER: Secondary 8722300 Postsecondary ______

Florida CIP 0646.021103

SECONDARY SCHOOL CREDITS __x__ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __x__ 9-12 ____Postsecondary Adult Vocational

____ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: TEC CONSTR @ 7 G CARPENTRY @ 7 G BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as carpenters (87102541), carpenter helpers (869.664-014).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, laying out, repairing, fabricating and erecting residential wooden structures and fixtures using hand tools and power tools.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program to provide instruction in the use of hand and power tools, selection and use of materials, estimating, and blueprint reading.

III. SPECIAL NOTE: Completion of the Carpentry Skills Program is a prerequisite for entry into this program, however, due to specific scheduling conflicts, enrollment in the core and specialization area concurrently may be necessary.

The Vocational Industrial Clubs of America, Inc., (VICA) is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Install exterior covering and trim.
02. Install doors.
03. Install windows.
04. Perform stair and step layout and construction.
05. Install interior wall and ceiling covering.
06. Install cabinets and shelving.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: 8722300

PROGRAM TITLE: Residential Trim Carpentry

01.0 INSTALL EXTERIOR COVERING AND TRIM--The student will be able to:

01.01 Identify styles of cornice.
01.02 Identify styles of siding.
01.03 Build a box cornice.
01.04 Install siding and trim.

02.0 INSTALL DOORS--The student will be able to:

02.01 Install door frame and hang door.
02.02 Identify parts of a door frame.
02.03 Install door hardware.

03.0 INSTALL WINDOWS--The student will be able to:

03.01 Identify parts of a window unit.
03.02 Install a window unit.

04.0 PERFORM STAIR AND STEP LAYOUT AND CONSTRUCTION--The student will be able to:

04.01 Identify parts of a staircase.
04.02 Calculate the number or risers and treads for a staircase.
04.03 Layout, cut and assemble a staircase (rough and finish).

05.0 INSTALL INTERIOR WALL AND CEILING COVERING--The student will be able to:

05.01 Install paneling and trim.
05.02 Install ceiling materials.
05.03 Install furring strips.
05.04 Install drywall.
05.05 Install insulation material.

06.0 INSTALL CABINETS AND SHELVING--The student will be able to:

06.01 Identify parts of a cabinet.
06.02 Identify types of cabinet door installation.
06.03 Identify types of cabinet hardware.
06.04 Install cabinet hardware.
06.05 Install custom built cabinet.
06.06 Install shelving.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Trim Carpentry	PROGRAM NUMBER:	8722300
COURSE TITLE:	Residential Trim Carpentry	COURSE NUMBER:	8722300

COURSE DESCRIPTION:

This course is designed to provide instruction in the safety practices and procedures relating to the use, care, and identification of hand tools, portable power tools, and woodworking machines, the precautions of working with job related materials, chemicals and electricity and identification of various types of construction materials are also included.

01.0 INSTALL EXTERIOR COVERING AND TRIM--The student will be able to:

01.01 Identify styles of cornice.
01.02 Identify styles of siding.
01.03 Build a box cornice.
01.04 Install siding and trim.

02.0 INSTALL DOORS--The student will be able to:

02.01 Install door frame and hang door.
02.02 Identify parts of a door frame.
02.03 Install door hardware.

03.0 INSTALL WINDOWS--The student will be able to:

03.01 Identify parts of a window unit.
03.02 Install a window unit.

04.0 PERFORM STAIR AND STEP LAYOUT AND CONSTRUCTION--The student will be able to:

04.01 Identify parts of a staircase.
04.02 Calculate the number or risers and treads for a staircase.
04.03 Layout, cut and assemble a staircase (rough and finish).

05.0 INSTALL INTERIOR WALL AND CEILING COVERING--The student will be able to:

05.01 Install paneling and trim.
05.02 Install ceiling materials.
05.03 Install furring strips.
05.04 Install drywall.
05.05 Install insulation material.

06.0 INSTALL CABINETS AND SHELVING--The student will be able to:

06.01 Identify parts of a cabinet.
06.02 Identify types of cabinet door installation.
06.03 Identify types of cabinet hardware.
06.04 Install cabinet hardware.
06.05 Install custom built cabinet.
06.06 Install shelving.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Roofing

CODE NUMBER: Secondary _______ Postsecondary I460410

Florida CIP 0646.041000

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __30, 31__

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ROOFING @ 7 G ¶BLDG CONST @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a roofer (87808561), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, ladders and scaffolds, waterproofing, and installation of all types of residential and commercial roofing.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safe use of tools and equipment including ladders and scaffolds, and the installation of shingle, built-up, single ply, and clay tile roofing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee.

This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Demonstrate use and care of hand tools and equipment.
03. Develop work estimates.
04. Identify types of roofing decks.
05. Install shingle roofs.
06. Install build-up roofing.
07. Install single-ply roofing.
08. Install clay tile roofing.
09. Demonstrate safe work habits.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial   SECONDARY NUMBER: ________
PROGRAM TITLE: Roofing   POSTSECONDARY NUMBER: 1460410

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Read and interpret the individual scales of the architect scale.
01.02 Read and interpret the individual scales of the engineers scale.
01.03 Identify and interpret architectural drawings.
01.04 Identify and read lines in the alphabet of lines.
01.05 Demonstrate knowledge and proficiency of commonly used symbols and abbreviations.
01.06 Read and interpret basic dimensions of linear, angular and circular types.
01.07 Determine area from given dimensions.
01.08 Demonstrate knowledge and proficiency of tolerance dimensions.
01.09 Convert blueprint dimensions to actual distance.
01.10 Define/identify the various blueprint/schematic terms.

02.0 DEMONSTRATE USE AND CARE OF HAND TOOLS AND EQUIPMENT--The student will be able to:

02.01 Identify basic hand tools.
02.02 Identify basic rules concerning safe use and care of tools and equipment.
02.03 Select correct tools for the selected skills.
02.04 Demonstrate the safe and correct use of each item of tools and equipment.
02.05 Select and demonstrate proper use of the types of ladders.
02.06 Demonstrate proper procedures in erecting a scaffold.

03.0 DEVELOP WORK ESTIMATES--The student will be able to:

03.01 Solve material and cost estimating problems.
03.02 Estimate time and wage costs to complete a specified job.
03.03 Develop cost comparison of performing versus contracting.
03.04 Determine materials and supplies according to blueprints.
03.05 Convert required materials and supplies to appropriate measure--square feet, squares, board feet, etc.
03.06 Prepare an order for materials and supplies.

04.0 IDENTIFY TYPES OF ROOFING DECKS--The student will be able to:

04.01 Identify purposes of a roof.
04.02 Identify roofing members.
04.03 Describe the seven roofing styles.
04.04 Lay out and demonstrate models of roof styles.

05.0 INSTALL SHINGLE ROOFS--The student will be able to:

05.01 Identify and select the most commonly used shingles.
05.02 Demonstrate cutting of roofing paper.
05.03 Demonstrate application of roofing paper.
05.04 Demonstrate use of nails and staples in attaching roof paper.
05.05 Demonstrate attachment of wood shingles.
05.06 Demonstrate use of punch for hole punching wood shingles.
05.07 Demonstrate attachment of fiberglass shingles.
05.08 Demonstrate attachment of asphalt shingles.

05.09 Select, prepare and install flashing materials.
05.10 Select and demonstrate use of fasteners for each shingle type.
05.11 Describe roofing paper and its uses.
05.12 Locate and repair leaks.

06.0 INSTALL BUILD-UP ROOFING--The student will be able to:

06.01 Describe characteristics of "build-up" roofs.
06.02 Identify, select and describe materials for "build-up" roof.
06.03 Demonstrate application of tar or asphalt to roof base.
06.04 Demonstrate step-by-step procedure for installation.
06.05 Select and prepare flashing materials including gravel stop fascia.
06.06 Select and demonstrate use of fasteners.
06.07 Demonstrate construction and attachment of pre-fabricated roof sections.
06.08 Locate and repair leaks.

07.0 INSTALL SINGLE-PLY ROOFING--The student will be able to:

07.01 Describe and apply criteria for single-ply roofs.
07.02 Demonstrate cutting of roofing paper.
07.03 Demonstrate installation of roofing paper.
07.04 Demonstrate use of nails and staples in attaching roofing paper.
07.05 Select and prepare flashing materials for installation.
07.06 Demonstrate installation of roofing materials with appropriate fasteners.
07.07 Describe roofing paper and its uses.
07.08 Locate and repair leaks.

08.0 INSTALL CLAY TILE ROOFING--The student will be able to:

08.01 Describe and apply criteria for using clay tile.
08.02 Demonstrate cutting of roofing paper.
08.03 Demonstrate installation of roofing paper.
08.04 Demonstrate use of nails and staples in attaching roofing paper.
08.05 Select and prepare flashing materials for installation.
08.06 Demonstrate use of punch in preparing holes for attaching tile roofing.
08.07 Locate and repair leaks.

09.0 DEMONSTRATE SAFE WORK HABITS--The student will be able to:

09.01 Describe requirements and use of portable and fixed access to upper level worksite.
09.02 Identify kinds of scaffolding procedures and requirements.
09.03 Identify housekeeping and general safety hazards while performing at elevated levels.
09.04 Identify requirements of medical and first aid services.
09.05 Demonstrate basic first aid procedures.
09.06 List and describe uses of personal protection devices and activities.
09.07 Identify and describe the classes and types of fires.
09.08 Identify and describe the types of fire extinguishers.
09.09 Operate a fire extinguisher.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.

10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Safety Engineering Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.070101

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS___

APPLICABLE LEVEL(S): ___7-9 ___9-12 ___Postsecondary Adult Vocational

x Postsecondary Vocational ___Other ____

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a compliance and enforcement inspector (21911026), safety inspector (168.264-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to technically assist in analyzing working conditions and providing technical assistance in the maintenance of materials, equipment, and fire safety systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in analyzing work place conditions determining potentially unsafe work place conditions, correcting unsafe conditions and safety engineering techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the

student will be able to:

01. Read and interpret blueprints and schematics.
02. Develop drawings or sketches of safety devices or plant layouts.
03. Demonstrate understanding of safety engineering techniques.
04. Analyze workplace environmental elements.
05. Demonstrate understanding of methods for correcting or preventing unsafe conditions.
06. Perform cost analyses of corrective measures.
07. Interpret related legislation.
08. Read, interpret, and write technical reports.
09. Develop safety training programs for hazardous work environments.
10. Demonstrate appropriate communication skills.
11. Demonstrate appropriate math skills.
12. Demonstrate appropriate understanding of basic science.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Safety Engineering Technology POSTSECONDARY NUMBER: ______

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Identify commonly used symbols and lines.
01.02 Read architect's scale and engineer's scale.
01.03 Identify mechanical symbols.
01.04 Read and interpret blueprints and specifications.

02.0 DEVELOP DRAWINGS OR SKETCHES OF SAFETY DEVICES OR PLANT LAYOUTS--The student will be able to:

02.01 Convert actual distance to blueprint/sketch dimensions.
02.02 Develop sketches from data.

03.0 DEMONSTRATE UNDERSTANDING OF SAFETY ENGINEERING TECHNIQUES--The student will be able to:

03.01 Apply sound/noise control concepts to operating equipment.
03.02 Apply equipment guarding techniques to operating equipment.
03.03 Determine dust control measures needed in an operational situation.

04.0 ANALYZE WORK PLACE ENVIRONMENTAL ELEMENTS--The student will be able to:

04.01 Analyze air samples for dust.
04.02 Analyze air samples for toxic fumes.
04.03 Determine minimum exposure times for workers, using a D6 meter.
04.04 Analyze the ergonomics of a work site.

05.0 DEMONSTRATE UNDERSTANDING OF METHODS FOR CORRECTING OR PREVENTING UNSAFE CONDITIONS--The student will be able to:

05.01 Explain the purpose of the American National Standards Institute and similar organizations.
05.02 Using standards tables, compute the minimum acceptable standards for state situations.
05.03 Using State and Federal Code and Regulations, determine acceptable work place standards.
05.04 Set up a preventative maintenance schedule for a facility and equipment.

06.0 PERFORM COST ANALYSIS OF CORRECTIVE MEASURES--The student will be able to:

06.01 Compute cost benefit and cost of alternative corrective measures.
06.02 Compute cost of down time versus cost of maintenance.
06.03 Compute cost of repairs versus cost of replacements, including tax benefits to company.

07.0 INTERPRET RELATED LEGISLATION--The student will be able to:

07.01 Explain how legislative or Congressional action becomes regulation.
07.02 Explain how regulatory agencies determine final regulation.
07.03 Given a specific regulation, explain how to get regulatory agency

clarification.
07.04 Determine how equipment and work conditions comply with state regulations.

08.0 READ, INTERPRET AND WRITE TECHNICAL REPORTS--The student will be able to:

08.01 Summarize a technical report.
08.02 Develop bar and line graphs.
08.03 Write a justification for corrective action.

09.0 DEVELOP SAFETY TRAINING PROGRAMS FOR HAZARDOUS WORK ENVIRONMENTS--The student will be able to:

09.01 Perform a job safety analysis.
09.02 Determine the safe and proper methods for doing a job.
09.03 Develop a training plan to insure development of proper work habits in workers trained.
09.04 Develop a refresher training program to review the safe and efficient methods of working in a hazardous area.

10.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

10.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
10.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
10.03 Read and follow written and oral instructions.
10.04 Answer and ask questions coherently and concisely.
10.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
10.06 Demonstrate appropriate telephone/communication skills.

11.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

11.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
11.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
11.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
11.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
11.05 Demonstrate an understanding of federal, state and local taxes and their computation.

12.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

12.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
12.02 Draw conclusions or make inferences from data.
12.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
12.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.
13.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: School Bus Driver Training

CODE NUMBER: Secondary _______ Postsecondary I490215

Florida CIP 0649.020501

SECONDARY SCHOOL CREDITS___ COLLEGE CREDITS______ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

____Postsecondary Vocational _x_Other30,31

CERTIFICATION COVERAGE: SC BS DR T @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a school bus driver (97111914), (913.463-010), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, operation of buses, loading, unloading, and transporting students, reporting delays or accidents on the road, and keeping records.

II. LABORATORY ACTIVITIES: Shop or driving range activities are an integral part of this program and provide instruction in loading, backing and maneuvering, both on a practice field and on public roads and highways with other traffic.

III. SPECIAL NOTE: In accordance with SBER 6A-3.0141(4) a certification of completion provided by the Commissioner shall be issued by the District to each driver successfully completing the forty (40) hours of pre-service training.

The typical length of this program for the average achieving student is 40 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform pre-trip inspection of vehicle.
02. Perform recordkeeping.
03. Place vehicle in motion.
04. Slow and stop vehicle.
05. Operate vehicle safely and efficiently in traffic, passing and turning.
06. Exhibit good general driving ability and habits.
07. Demonstrate ability to give emergency first aid.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: School Bus Driver Training POSTSECONDARY NUMBER: I490215

01.0 PERFORM PRE-TRIP INSPECTION OF VEHICLE--The student will be able to:

01.01 Check for and interpret fluid leaks on the ground.
01.02 Check for underinflated, flat, worn, or damaged tires.
01.03 Check for loose or missing lug nuts.
01.04 Check the physical appearance of the bus.
01.05 Check the engine compartment fluid levels.
01.06 Check the condition of the engine compartment drive belts.
01.07 Check the condition of the engine wiring harness.
01.08 Check the condition of the spark plug wires.
01.09 Check the condition of all hoses.
01.10 Properly check the fire extinguisher.
01.11 Check the condition of the first aid kit.
01.12 Check quantity and secure mounting of the reflective triangles.
01.13 Properly adjust the driver's seat and seatbelt.
01.14 Check and adjust all mirrors.
01.15 Check brake system for proper vacuum or air pressure.
01.16 Assure adequate fuel level for the trip.
01.17 Check for adequate oil pressure.
01.18 Check the charging system for proper operation.
01.19 Determine that the engine cooling system is operating normally.
01.20 Check the directional signals.
01.21 Check the pupil warning lights.
01.22 Check the tail lights.
01.23 Check the interior bus lights.
01.24 Check the defrosters.
01.25 Check the heater system.
01.26 Check the service door.
01.27 Check the emergency door.
01.28 Check the clearance and I.D. lights.
01.29 Check the stop lights.
01.30 Check the emergency flashers.
01.31 Check the headlights.
01.32 Check the stop arm and lights.
01.33 Check the operation of the horn.
01.34 Inspect the bus interior for cleanliness.
01.35 Check the exhaust system for leaks.
01.36 Perform an operational test of the brake system.
01.37 Check for unusual or strong odors.
01.38 Check for loose or too stiff steering.

02.0 PERFORM RECORDKEEPING--The student will be able to:

02.01 Keep the route book up to date.
02.02 Prepare an accident report.
02.03 Report any unsafe conditions on the county-developed bus inspection form.
02.04 Note all times and odometer readings on the field trip form.
02.05 Perform any other recordkeeping as required by the Transportation Department.

03.0 PLACE VEHICLE IN MOTION--The student will be able to:

03.01 Insert key in ignition.
03.02 Close the doors.
03.03 Adjust the driver's seat.

03.04 Adjust the driver's seat belt.
03.05 Check the mirrors for proper adjustment.
03.06 Set the parking brake.
03.07 Place gear selector in neutral for manual shift; neutral or park for automatic.
03.08 Press clutch (manual shift).
03.09 Turn key to start position and release when the engine starts.
03.10 Place a vehicle with a standard transmission in motion.
03.11 Place a vehicle with an automatic transmission in motion.

04.0 SLOW AND STOP VEHICLE--The student will be able to:

04.01 Check and evaluate traffic conditions.
04.02 Position the vehicle appropriately.
04.03 Release the accelerator.
04.04 Brake to a smooth stop.
04.05 Press clutch just prior to a complete stop (manual shift).
04.06 Shift to an appropriate gear position.
04.07 Set the parking brake.
04.08 Turn off all accessories and ignition.

05.0 OPERATE VEHICLE SAFELY AND EFFICIENTLY IN TRAFFIC, PASSING, AND TURNING--The student will be able to:

05.01 Determine safe following distances under all weather conditions.
05.02 Demonstrate proper procedures for crossing railroad tracks.
05.03 Demonstrate knowledge of which driver must yield the right-of-way in various situations.
05.04 Demonstrate proper knowledge and understanding of green, yellow and red traffic signals.
05.05 Explain when passing on the right and on the left is permitted and/or prohibited.
05.06 Demonstrate ability to make a right turn.
05.07 Demonstrate ability to make a left turn.

06.0 EXHIBIT GOOD GENERAL DRIVING ABILITY AND HABITS--The student will be able to:

06.01 Identify the meaning of the standard colors used on traffic signs.
06.02 Identify the meaning of the standard shapes used on traffic signs.
06.03 Identify standard roadway markings.
06.04 Identify and list a set of principles for preventing and correcting any kind of traction loss.
06.05 Explain the correct response for loss of brakes.
06.06 Explain the correct response for steering failure.
06.07 Explain the correct response for tire blow-out.
06.08 Explain the correct response for headlight failure.
06.09 Explain the correct response for accelerator sticking.
06.10 Explain the correct response for engine overheating.
06.11 Identify the three classifications of fires and name the types of fire extinguishers for each.
06.12 Explain emergency evacuation procedures.
06.13 Explain the requirements and correct procedures for staking out a disabled school bus.
06.14 Explain the legal requirements and recommendations on stop locations for loading and unloading passengers.
06.15 Describe the proper and improper use of the alternately flashing red and amber pupil warning lights.
06.16 Correctly sequence the necessary actions for loading passengers on the highway or street.
06.17 Correctly sequence the necessary actions for loading passengers on school or other private property.

06.18 Correctly sequence the necessary actions for loading passengers at a turn-around stop.
06.19 Correctly sequence the necessary actions for unloading passengers on school or other private property.
06.20 Correctly sequence the necessary actions for unloading passengers on the highway or street.
06.21 Correctly sequence the necessary actions for unloading passengers at a turn-around stop.
06.22 Explain the procedure for reporting motorists who illegally pass the bus when loading and unloading passengers.
06.23 Explain the importance of maintaining an accurate time schedule.
06.24 Describe the nature of young people.
06.25 Describe the stages of human development.
06.26 Explain how desires, fears, and drives of young people motivate their behavior.
06.27 Identify common characteristics of people and describe how to deal with these characteristics.
06.28 Identify negative roadblocks to effective communications with students.
06.29 Identify driver actions that affect positive student behavior.
06.30 State the responsibilities of the passenger management team members.
06.31 Explain how to communicate important information to exceptional education children.
06.32 Explain how to handle behavior problems with special education children.
06.33 Explain how to handle health problems with exceptional education children.
06.34 Explain when and how exceptional children should be evacuated from a school bus.
06.35 Explain the proper treatment for handling on-board seizures.
06.36 Explain the use and importance of the medical information card.

07.0 DEMONSTRATE THE ABILITY TO GIVE FIRST AID--The student will be able to:

07.01 Explain and demonstrate the proper procedure for mouth-to-mouth and mouth-to-nose resuscitation.
07.02 Explain and demonstrate the proper procedure for clearing an obstructed airway.
07.03 Explain and demonstrate the proper methods of controlling bleeding.
07.04 Identify the symptoms of shock and explain the proper procedure for treating shock.
07.05 Explain the proper treatment for eye injuries, vomiting, mouth or face injuries, fainting, falls, and epileptic seizures.
07.06 Identify the location and contents of the first aid kit.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.

09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.

09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.

09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

10.02 Draw conclusions or make inferences from data.

10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.

11.02 Secure information about a job.

11.03 Identify documents which may be required when applying for a job interview.

11.04 Complete a job application form correctly.

11.05 Demonstrate competence in job interview techniques.

11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.

11.07 Identify acceptable work habits.

11.08 Demonstrate knowledge of how to make appropriate job changes.

11.09 Demonstrate acceptable employee health habits.

11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Identify characteristics of the American enterprise system.

12.02 Define inflation and deflation.

12.03 Illustrate the basic economic questions facing any society.

12.04 Determine the results of a change in demand or a change in supply.

12.05 List factors which contribute to economic growth.

12.06 Identify characteristics of different types of business ownership.

12.07 Choose appropriate action in a situation requiring application of business ethics.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Sheet Metal Work

CODE NUMBER: Secondary ______ Postsecondary 1480506

Florida CIP 0648.050600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: SHEET METAL @ 7 G METAL WORK @ 7 G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as a sheet metal worker (89132677), (804.281-010), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the layout, fabrication, erection, or installation and maintenance of items made of sheet steel, copper, stainless steel and aluminum using handtools and machines.

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in layout, cutting, forming, fabricating and installing mechanical, architectural and specialty metal products.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and trade safety practices.
02. Read blueprints.
03. Lay out sheet metal.
04. Fabricate mechanical systems.
05. Fabricate architectural/roofing sheet metal.
06. Fabricate specialty sheet metal.
07. Fabricate food and beverage dispensing equipment.
08. Weld sheet metal.
09. Install mechanical systems.
10. Install architectural/roofing sheet metal.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Sheet Metal Work POSTSECONDARY NUMBER: I480506

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES--The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonstrate use and care of tools.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
03.04 Develop shop drawings.

03.0 LAYOUT SHEET METAL--The student will be able to:

03.01 Lay out rectangular straight duct.
03.02 Lay out rectangular square throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS--The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow.
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset.
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket government look.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct ection.

05.0 FABRICATE ARCHITECTURAL/ROOFING SHEET METAL--The student will be able

to:

05.01 Fabricate batten seam metal roof panel and ap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-look roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular downspout/conductor.
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel top fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.
05.14 Fabricate metal ceiling panel.

06.0 FABRICATE SPECIALTY SHEET METAL--The student will be able to:

06.01 Fabricate rectangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.
06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice).

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT--The student will be able to:

07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL--The student will be able to:

08.01 Weld aluminum with gas tungsten are welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless steel with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tungsten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) equipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel/copper/stainless steel.

09.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single well equipment casing/housing.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL--The student will be able to:

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee gutter.
10.05 Install half-round gutter.

10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing.
10.10 Install coping.
10.11 Install gravel stop fascia.
10.12 Install metal siding.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as

recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Shoe Repair and Leatherwork

CODE NUMBER: Secondary 8748000 Postsecondary I470406

Florida CIP 0648.030400

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9 x 9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: SHOE REPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment with such titles as shoe and leather worker (89511697), shoe repairer (365.361-014). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: use and care of hand tools and machines; selection, application and care of materials; interpretation of repair orders and instructions; and repairing and modifying shoes, boots and other leather items using hand tools, power tools and machines.

Listed below are the courses that comprise this program when offered at the secondary level:

8748010	Shoe Repair and Leatherwork 1
8748020	Shoe Repair and Leatherwork 2
8748030	Shoe Repair and Leatherwork 3

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When the cooperative education method of instruction is used, the program length for the secondary program may be increased by a maximum of 2.0 credits.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 450 hours.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of the types and care of shoes and boots.
02. Explain shoe and boot construction.
03. Select, use and perform user maintenance on hand tools and power driven machines.
04. Demonstrate proficiency in safety and first aid.
05. Repair shoes and boots including parts replacement and sewing.
06. Make orthopedic alterations a specification.
07. Dye and refinish leather.
08. Repair other leather articles such as handbags, belts and luggage.
09. Demonstrate salesmanship and simple bookkeeping skills.
10. Demonstrate knowledge of the free enterprise system.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8748000

PROGRAM TITLE: Shoe Repair and Leatherwork POSTSECONDARY NUMBER: I470406

01.0 DEMONSTRATE AN UNDERSTANDING OF THE TYPES AND CARE OF SHOES AND BOOTS--The student will be able to:

01.01 Identify and describe various types of shoes.
01.02 Identify various kinds of boots.
01.03 Describe procedures for care and maintenance for shoes.
01.04 Describe procedures for care and maintenance for boots.
01.05 Describe procedures for care and maintenance of other leather articles.

02.0 EXPLAIN SHOE AND BOOT CONSTRUCTION--The student will be able to:

02.01 List sources of upper materials.
02.02 Identify and describe upper materials.
02.03 List the types of bottom leathers.
02.04 Describe the types of bottom leather.
02.05 Describe the grades of bottom leather.
02.06 Describe the cuts of bottom leather.
02.07 Describe and weights of bottom leather.
02.08 Identify and describe weights of rubber soles.
02.09 Identify and describe grades of rubber soles.
02.10 Identify and describe sizes of rubber soles.
02.11 Identify and describe weights of composition soles.
02.12 Identify and describe grades of composition soles.
02.13 Identify and describe sizes of composition soles.
02.14 Describe the types and kinds of rubber heels.
02.15 List weights and colors of composition lifts.
02.16 List weights and colors of rubber lifts.
02.17 Identify and describe the kinds of uses of mails and thread.

03.0 SELECT, USE AND PERFORM USER MAINTENANCE ON HAND TOOLS AND POWER DRIVEN MACHINES--The student will be able to:

03.01 Identify hand tools.
03.02 Select appropriate tool for the job skills.
03.03 Demonstrate safe, proper use and care of hand tools.
03.04 Identify power tools.
03.05 Select appropriate power tool for the job skill.
03.06 Demonstrate safe, proper use and care of power tools.
03.07 Identify special tools.
03.08 Determine causes of machine malfunction using trouble shooting skills.
03.09 Perform preventative maintenance inspections.

04.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID--The student will be able to:

04.01 Demonstrate ability to work safely by applying personal safety rules.
04.02 Demonstrate ability to keep a clean, orderly and safe work area.
04.03 Operate a fire extinguisher.
04.04 Apply basic first aid procedures.
04.05 Demonstrate safe use of hand and power tools.
04.06 Recognize and identify common safety hazards.
04.07 Apply shop policies, shoe safety rules and procedures.

04.08 Demonstrate knowledge of proper storage of liquid materials.
04.09 Perform shop housekeeping duties.

05.0 REPAIR SHOES AND BOOTS INCLUDING PARTS REPLACEMENT AND SEWING--The student will be able to:

05.01 Identify the types of seams in hand and machine patching.
05.02 Identify the kinds of stitches associated with each seam in hand and machine patching.
05.03 Identify and select appropriate needle size.
05.04 Identify and select appropriate thread size.
05.05 Demonstrate and perform use of joint seams by hand.
05.06 Demonstrate and perform use of overlap or facing seam by hand.
05.07 Demonstrate and perform use of facing seam by machine.
05.08 Demonstrate and perform use of lap seam by machine.
05.09 List and identify the types and kinds of heels.
05.10 Remove old heels, prepare and attach new heels to different types of shoes.
05.11 Demonstrate removal of half soles on each type.
05.12 Demonstrate procedure for attaching or replacing half sole on each type.
05.13 Demonstrate removal of full soles on each type.
05.14 Perform replacement procedures of full soles on each type.

06.0 MAKE ORTHOPEDIC ALTERATIONS TO SPECIFICATION--The student will be able to:

06.01 Identify the different specialized types of orthopedic devices.
06.02 Demonstrate knowledge of repair and alteration of specialized orthopedic devices to specification.

07.0 DYE AND REFINISH LEATHER--The student will be able to:

07.01 Explain difference in shining and cleaning of smooth or grain leather.
07.02 List the steps, and demonstrate shining of smooth or grain leather.
07.03 List the steps and demonstrate the cleaning of smooth or grain leather.
07.04 List the steps and demonstrate the cleaning of fabric shoes.
07.05 List the steps and demonstrate the cleaning of suede.
07.06 List the steps and demonstrate the cleaning of reptile leather.
07.07 Explain the difference in dyeing and refinishing smooth or grain leather.
07.08 List the steps and demonstrate dyeing and smooth or grain leather.
07.09 List the steps in dyeing fabric shoes.
07.10 Demonstrate the steps and demonstrate dyeing of suede.

08.0 REPAIR OTHER LEATHER ARTICLES SUCH AS HANDBAGS, BELTS, AND LUGGAGE--The student will be able to:

08.01 Identify special tools.
08.02 Explain fundamental processes of fabrication and tooling of other leather goods.
08.03 List and describe procedures for fabrication and repair of special items such as belts, luggage, and handbags.
08.04 Solve material and cost estimating problems.
08.05 Apply cleaning and dyeing procedures.
08.06 Demonstrate procedures of fabrication and tooling.

09.0 DEMONSTRATE SALESMANSHIP AND SIMPLE BOOKKEEPING SKILLS--The student will be able to:

09.01 Comply with local rules, laws and regulations.
09.02 Develop an operating budget and accounting practices.
09.03 Select site and prepare an advertising plan.
09.04 Estimate cost and completion time.
09.05 Complete work order and identification systems.
09.06 Prepare and take inventory of parts and supplies.
09.07 Supervise the work of others.
09.08 Identify and select items for resale.
09.09 Develop and implement a business schedule.
09.10 Organize a display.

10.0 DEMONSTRATE KNOWLEDGE OF THE FREE ENTERPRISE SYSTEM--The student will be able to:

10.01 State the importance of the free enterprise system to the economy.
10.02 State the role of the shoe repair and leatherwork industry within the free enterprise system.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job

interview.

14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the necessary personal characteristics of a successful efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair and Leatherwork PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair and Leatherwork 1 COURSE NUMBER: 8748010

COURSE DESCRIPTION:

This course is designed to provide instruction in the understanding of the types of the types and care of shoes and boots, and in shoe and boot construction.

01.0 DEMONSTRATE AN UNDERSTANDING OF THE TYPES AND CARE OF SHOES AND BOOTS--The student will be able to:

01.01 Identify and describe various types of shoes.
01.02 Identify various kinds of boots.
01.03 Describe procedures for care and maintenance for shoes.
01.04 Describe procedures for care and maintenance for boots.
01.05 Describe procedures for care and maintenance of other leather articles.

02.0 EXPLAIN SHOE AND BOOT CONSTRUCTION--The student will be able to:

02.01 List sources of upper materials.
02.02 Identify and describe upper materials.
02.03 List the types of bottom leathers.
02.04 Describe the types of bottom leather.
02.05 Describe the grades of bottom leather.
02.06 Describe the cuts of bottom leather.
02.07 Describe and weights of bottom leather.
02.08 Identify and describe weights of rubber soles.
02.09 Identify and describe grades of rubber soles.
02.10 Identify and describe sizes of rubber soles.
02.11 Identify and describe weights of composition soles.
02.12 Identify and describe grades of composition soles.
02.13 Identify and describe sizes of composition soles.
02.14 Describe the types and kinds of rubber heels.
02.15 List weights and colors of composition lifts.
02.16 List weights and colors of rubber lifts.
02.17 Identify and describe the kinds of uses of mails and thread.

03.0 SELECT, USE AND PERFORM USER MAINTENANCE ON HAND TOOLS AN POWER DRIVEN MACHINES--The student will be able to:

03.01 Identify hand tools.
03.02 Select appropriate tool for the job skills.
03.03 Demonstrate safe, proper use and care of hand tools.
03.04 Identify power tools.
03.05 Select appropriate power tool for the job skill.
03.06 Demonstrate safe, proper use and care of power tools.
03.07 Identify special tools.
03.08 Determine causes of machine malfunction using trouble shooting skills.
03.09 Perform preventative maintenance inspections.

04.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID--The student will be able to:

04.01 Demonstrate ability to work safely by apply personal safety rules.

04.02 Demonstrate ability to keep a clean, orderly and safe work area.
04.03 Operate a fire extinguisher.
04.04 Apply basic first aid procedures.
04.05 Demonstrate safe use of hand and power tools.
04.06 Recognize and identify common safety hazards.
04.07 Apply shop policies, shoe safety rules and procedures.
04.08 Demonstrate knowledge of proper storage of liquid materials.
04.09 Perform shop housekeeping duties.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair and Leatherwork PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair and Leatherwork 2 COURSE NUMBER: 8748020

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing shoes and boots and includes parts replacement, sewing, and refinishing leather.

05.0 REPAIR SHOES AND BOOTS INCLUDING PARTS REPLACEMENT AND SEWING--The student will be able to:

05.01 Identify the types of seams in hand and machine patching.
05.02 Identify the kinds of stitches associated with each seam in hand and machine patching.
05.03 Identify and select appropriate needle size.
05.04 Identify and select appropriate thread size.
05.05 Demonstrate and perform use of joint seams by hand.
05.06 Demonstrate and perform use of overlap or facing seam by hand.
05.07 Demonstrate and perform use of facing seam by machine.
05.08 Demonstrate and perform use of lap seam by machine.
05.09 List and identify the types and kinds of heels.
05.10 Remove old heels, prepare and attach new heels to different types of shoes.
05.11 Demonstrate removal of half soles on each type.
05.12 Demonstrate procedure for attaching or replacing half sole on each type.
05.13 Demonstrate removal of full soles on each type.
05.14 Perform replacement procedures of full soles on each type.

06.0 MAKE ORTHOPEDIC ALTERATIONS TO SPECIFICATION--The student will be able to:

06.01 Identify the different specialized types of orthopedic devices.
06.02 Demonstrate knowledge of repair and alteration of specialized orthopedic devices to specification.

07.0 DYE AND REFINISH LEATHER--The student will be able to:

07.01 Explain difference in shining and cleaning of smooth or grain leather.
07.02 List the steps, and demonstrate shining of smooth or grain leather.
07.03 List the steps and demonstrate the cleaning of smooth or grain leather.
07.04 List the steps and demonstrate the cleaning of fabric shoes.
07.05 List the steps and demonstrate the cleaning of suede.
07.06 List the steps and demonstrate the cleaning of reptile leather.
07.07 Explain the difference in dyeing and refinishing smooth or grain leather.
07.08 List the steps and demonstrate dyeing smooth or grain leather.
07.09 List the steps in dyeing fabric shoes.
07.10 Demonstrate the steps and demonstrate dyeing of suede.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Shoe Repair and Leatherwork	PROGRAM NUMBER:	8748000
COURSE TITLE:	Shoe Repair and Leatherwork 3	COURSE NUMBER:	8748030

COURSE DESCRIPTION:

This course is designed to provide instruction in the repairing of leather articles such as handbags, belts, and luggage, and in developing salesmanship and simple bookkeeping skills.

08.0 REPAIR OTHER LEATHER ARTICLES SUCH AS HANDBAGS, BELTS, AND LUGGAGE--The student will be able to:

08.01 Identify special tools.
08.02 Explain fundamental processes of fabrication and tooling of other leather goods.
08.03 List and describe procedures for fabrication and repair of special items such as belts, luggage, and handbags.
08.04 Solve material and cost estimating problems.
08.05 Apply cleaning and dyeing procedures.
08.06 Demonstrate procedures of fabrication and tooling.

09.0 DEMONSTRATE SALESMANSHIP AND SIMPLE BOOKKEEPING SKILLS--The student will be able to:

09.01 Comply with local rules, laws and regulations.
09.02 Develop an operating budget and accounting practices.
09.03 Select site and prepare an advertising plan.
09.04 Estimate cost and completion time.
09.05 Complete work order and identification systems.
09.06 Prepare and take inventory of parts and supplies.
09.07 Supervise the work of others.
09.08 Identify and select items for resale.
09.09 Develop and implement a business schedule.
09.10 Organize a display.

10.0 DEMONSTRATE KNOWLEDGE OF THE FREE ENTERPRISE SYSTEM--The student will be able to:

10.01 State the importance of the free enterprise system to the economy.
10.02 State the role of the shoe repair and leatherwork industry within the free enterprise system.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statues Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the necessary personal characteristics of a successful efficiently and effectively.

CURRICULUM FRAMEWORK　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Solar Heating and Cooling Technology

CODE NUMBER: Secondary ______　　Postsecondary ______

Florida CIP 0615.050500

SECONDARY SCHOOL CREDITS ______　　COLLEGE CREDITS __x__　　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9　____ 9-12　____ Postsecondary Adult Vocational

__x__ Postsecondary Vocational　　____ Other ______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a solar engineering technician, heating technician (007.181-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, solar system planning, installation, repair and maintenance, prevailing building codes, and retro-fitting existing structures with solar systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in design, installation, and testing of solar equipment assemblies.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints, schematics, and building codes.
02. Demonstrate basic plumbing skills.
03. Demonstrate basic carpentry and roofing skills.
04. Demonstrate basic electrical skills.
05. Demonstrate knowledge of basic control systems.
06. Demonstrate knowledge of prevailing building codes.
07. Assist with the design, installation and testing of solar equipment systems.
08. Troubleshoot malfunctioning active and passive solar heating systems.
09. Perform cost estimates.
10. Perform cost comparisons of alternative systems.
11. Prepare, analyze, and evaluate technical reports and data.
12. Demonstrate knowledge of insulating and conductive properties of materials.
13. Demonstrate appropriate communication skills.
14. Demonstrate appropriate math skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: Solar Heating and Cooling Technology — POSTSECONDARY NUMBER: ________

01.0 READ AND INTERPRET BLUEPRINTS, SCHEMATICS, AND BUILDING CODES--The student will be able to:

01.01 Identify architectural symbols.
01.02 Identify electrical symbols.
01.03 Identify mechanical symbols.
01.04 Identify topographical symbols.
01.05 Interpret land surveyor's notes.
01.06 Interpret architectural drawings and specifications.
01.07 Interpret structural drawings.
01.08 Apply A.S.T.M. standards.
01.09 Apply C.S.A. standards.
01.10 Evaluate shop drawings.
01.11 Interpret mechanical drawings.
01.12 Interpret electrical drawings.

02.0 DEMONSTRATE BASIC PLUMBING SKILLS--The student will be able to:

02.01 Braze aluminum tubing.
02.02 Cut copper tubing.
02.03 Bend cooper tubing.
02.04 Braze weld copper tubing.
02.05 Cut steel pipe.
02.06 Cut PVC pipe.
02.07 Dislodge obstructions from tubing.
02.08 Flare cooper tubing.
02.09 Braze two metal joints.
02.10 Assemble specialized fittings.
02.11 Install pipe.
02.12 Secure pipe to various surfaces.
02.13 Insulate water pipes.
02.14 Pressure test water system.
02.15 Select appropriate water system components.

03.0 DEMONSTRATE BASIC CARPENTRY AND ROOFING SKILLS--The student will be able to:

03.01 Estimate materials.
03.02 Maintain tools as needed.
03.03 Install rough frame.
03.04 Install diagonal bracing.
03.05 Construct roof truss.
03.06 Install collar beams.
03.07 Install rafters.
03.08 Install roofing felt.
03.09 Install shingles.
03.10 Operate hand tools.
03.11 Cut materials to size.

04.0 DEMONSTRATE BASIC ELECTRICAL SKILLS--The student will be able to:

04.01 Calculate circuit load.
04.02 Select conductors.
04.03 Connect wiring to specified terminals.
04.04 Install circuit box.

04.05 Ground electrical system.
04.06 Install outlets.

05.0 DEMONSTRATE KNOWLEDGE OF BASIC CONTROL SYSTEMS--The student will be able to:

05.01 Mount temperature sensors.
05.02 Install central wiring.
05.03 Install valve operators.
05.04 Install damper operators.
05.05 Calibrate sensors.

06.0 DEMONSTRATE KNOWLEDGE OF PREVAILING BUILDING CODES--The student will be able to:

06.01 Apply O.S.H.A. standard.
06.02 Apply local codes.
06.03 Interpret application of regulations.

07.0 ASSIST WITH THE DESIGN, INSTALLATION AND TESTING OF SOLAR EQUIPMENT SYSTEMS--The student will be able to:

07.01 Select heat storage unit.
07.02 Select auxiliary boiler.
07.03 Design collector system.
07.04 Design heat transfer medium.
07.05 Position dampers.
07.06 Install control blowers.
07.07 Install louver-type dampers.
07.08 Install back-draft dampers.
07.09 Design filters.
07.10 Design duct installation.
07.11 Construct pebble bed containers.

08.0 TROUBLESHOOT MALFUNCTIONING ACTIVE AND PASSIVE SOLAR HEATING SYSTEM--The student will be able to:

08.01 Check conditions of collectors and heat exchangers.
08.02 Check piping, storage tanks and pumps.
08.03 Evaluate valves for leakage.
08.04 Evaluate condition of insulation.
08.05 Check fluid levels.
08.06 Check antifreeze concentration in collector circuit.
08.07 Lubricate pump and blower motors.
08.08 Align blowers wheels.
08.09 Clean air filters.
08.10 Adjust air-flow.
08.11 Check control system for sensing.

09.0 PERFORM COST ESTIMATES--The student will be able to:

09.01 Read supply catalogs.
09.02 Price labor costs.
09.03 Determine profit margin.
09.04 Schedule time required.
09.05 Calculate total expenses.
09.06 Develop actual consumer cost.

10.0 PERFORM COST COMPARISONS OF ALTERNATIVE SYSTEMS--The student will be able to:

10.01 Identify other solar systems.

10.02 Compare characteristics as needed.
10.03 Analyze costs.

11.0 PREPARE, ANALYZE, AND EVALUATE TECHNICAL REPORTS AND DATA--The student will be able to:

11.01 Write description of system design.
11.02 Collect specification data from operable system.
11.03 Evaluate operation of system.

12.0 DEMONSTRATE KNOWLEDGE OF INSULATING AND CONDUCTIVE PROPERTIES OF MATERIALS--The student will be able to:

12.01 Identify various insulations.
12.02 Select appropriate insulations based on system design.
12.03 Install various insulations.

13.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

13.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
13.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
13.03 Read and follow written and oral instructions.
13.04 Answer and ask questions coherently and concisely.

13.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
13.06 Demonstrate appropriate telephone/communication skills.

14.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

14.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
14.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
14.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
14.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
14.05 Demonstrate an understanding of federal, state and local taxes and their computation.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

5.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job

interview.

16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make appropriate job changes.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Space Engineering Technology

CODE NUMBER: Secondary _____ Postsecondary _____

Florida CIP 0615.080101

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

__x__ Postsecondary Vocational _____ Other

CERTIFICATION COVERAGE:

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for initial employment as technicians at space vehicle launch facilities (8599963), or to provide supplemental training for persons previously or currently employed in these occupations.

The specialization content should include, but not be limited to, Basic Electricity & Instrumentation, Soldering, Engineering Graphics, Engineering Machine Practices, Microcomputer Applications and Quality Assurance. A minimum of 15 semester hours with at least two components of this core must be of courses designed to develop skills in oral and written communication and in computational skills. Integrated into this content will be leadership skills, human relation skills, employability skills, safe and efficient work practices, technical recording and reporting.

Elective competencies are chosen from courses in Thermal Protection Systems, Electrical & Mechanical Systems, Management, Computer Aided Drafting, Environmental Control Systems, Non-Destructive Testing, and Digital Logic.

II. **LABORATORY ACTIVITIES:** Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry.

III. **SPECIAL NOTE:** The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

This program includes a common core of general education competencies as identified by the industry, which is prerequisite for all Associate in Science Degree programs.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-

job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Instruction in microcomputer applications and high level languages is appropriate for inclusion in this program. Algebra is a recommended prerequisite for entry into this program.

The typical length of this program for the average achieving student is an A.S. degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in the fundamental principles of electricity and electronics.
02. Demonstrate proficiency in the operation of standard electronic test equipment to measure basic electrical parameters.
03. Demonstrate proficiency in the high reliability soldering and fabrication.
04. Demonstrate proficiency in the basics of engineering machine practices.
05. Demonstrate proficiency in the basics of engineering graphics.
06. Demonstrate proficiency in the use of word processing, spreadsheets and data management systems using microcomputers.
07. Demonstrate proficiency in the fundamental concepts of quality assurance.
08. Demonstrate proficiency in modern quality assurance inspection techniques.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Space Engineering Technology POSTSECONDARY NUMBER:

01.0 **DEMONSTRATE PROFICIENCY IN THE FUNDAMENTAL PRINCIPLES OF ELECTRICITY AND ELECTRONICS.** The student will be able to:

01.01 Explain the relationship between current, voltage, resistance and power.
01.02 Solve DC network problems involving series, parallel and series-parallel networks.
01.03 Using a schematic diagram as a guide, construct and evaluate the operation of basic DC circuits.
01.04 Given a wiring diagram of a circuit containing DC components, draw a schematic diagram of the circuit.
01.05 Use analog and digital multimeters to measure voltage, current and resistance in simple and complex circuits.
01.06 Explain and demonstrate the properties of various types of batteries and other energy storage devices.
01.07 Demonstrate the application of network theorems including Kirchoff's voltage and current laws and the superposition theorem.
01.08 Evaluate the sinusoidal (AC) waveform.
01.09 Describe and explain the operation of circuits containing R, L, and C elements.
01.10 Explain the relationship between current, voltage, resistance and power in AC circuits.
01.11 Solve AC network problems involving series, parallel and series-parallel networks.
01.12 Using a schematic diagram as a guide, construct and evaluate the operation of basic AC circuits.
01.13 Given a wiring diagram of a circuit containing DC and AC components, draw a schematic diagram of the circuit.
01.14 Use analog and digital multimeters to measure voltage, current in simple and complex AC circuits.
01.15 Demonstrate the analysis of multi-source AC networks.
01.16 Demonstrate the application of network theorems including Kirchoff's voltage and current laws and the superposition theorem in AC circuits.
01.17 Explain and demonstrate the operation of resonant networks.
01.18 Explain the basic properties of magnetic circuits.
01.19 Explain and demonstrate the operation of DC motors and generators.
01.20 Explain and demonstrate the operation of AC motors and generators.
01.21 State the basic safety procedures designed to protect personnel, the test equipment and the circuit under test.
01.22 Demonstrate the operation of meggers.
01.23 Demonstrate the operation of a reflectometer.
01.24 Demonstrate the use of a Break-Out-Box.
01.25 Explain and demonstrate the operation of semiconductor diodes and transistors.
01.26 Explain and demonstrate the operation of basic transistor circuits.
01.27 Explain and demonstrate the operation and application of simple integrated circuits including operational amplifiers.
01.28 Explain and demonstrate the operation of basic digital devices and circuits.

02.0 **DEMONSTRATE PROFICIENCY IN THE OPERATION OF STANDARD ELECTRONIC TEST EQUIPMENT TO MEASURE BASIC ELECTRICAL PARAMETERS.** The student will be able to:

02.01 Review basic analog and digital electrical concepts and definitions.
02.02 Discuss and analyze the procedures and methods required to insure proper measurement techniques including measurement, data recording, reports, graphing, precision, accuracy, errors and statistical analysis of data.
02.03 Operate safely in the laboratory environment.
02.04 Use proper instrument grounding techniques.
02.05 Describe and demonstrate the effects of electromagnetic interference on measurement systems and the methods used tominimize these effects.
02.06 Describe and demonstrate the operation of analog DC and AC meters.
02.07 Describe and demonstrate the operation of digital DC and AC meters.
02.08 Compare analog and digital meter operation.
02.09 Describe the operation of counters, digital encoders and display devices.
02.10 Describe and demonstrate the operation of digital multimeters.
02.11 Describe the methods used in the laboratory to make accurate measurements of basic electrical parameters.
02.12 Demonstrate the operation of digital impedance meters.
02.13 Demonstrate the operation of all front panel controls of a standard laboratory oscilloscope in typical laboratory oscilloscope.
02.14 Describe the circuitry of a standard laboratory oscilloscope.
02.15 Describe and demonstrate the operation of AC and DC signal sources including laboratory power supplies, oscillators, function generators, sweep generators and RF signal generators.
02.16 Describe and demonstrate the operation of a universal counter/timer.
02.17 Demonstrate and describe the operation of a strip chart and X-Y recorders.
02.18 Describe and demonstrate the operation of transducers used to convert light, temperature, mechanical strain and position, pressure and radiation to electrical parameters for measurement.
02.19 Analyze, describe and demonstrate the use of instrumentation amplifiers for use with transducers.
02.20 Describe the operation and application of spectrum and network analyzers.
02.21 Describe the operation and application of a cable fault analyzer.
02.22 Describe the operation and application of a megger.
02.23 Describe the operation and application of a bonding meter (Milliohmmeter).
02.24 Define the term calibration.
02.25 Describe some methods and the documentation of instrument calibration.
02.26 Describe NBS time and frequency standards.
02.27 Explain and describe the contents of military specifications and standards.
02.28 Construct, test and calibrate a basic test instrument.

03.0 DEMONSTRATE PROFICIENCY IN HIGH RELIABILITY SOLDERING AND FABRICATION. The student will be able to:

03.01 Review basic math and electronics concepts.
03.02 Demonstrate laboratory safety.
03.03 Explain the effects of static electricity.
03.04 Demonstrate ESD safety procedures.
03.05 Describe the construction of printed circuit boards.
03.06 Explain the theoretical concepts of soldering.
03.07 Demonstrate the use of basic hand tools.
03.08 Demonstrate proper soldering techniques--axial lead components.

03.09 Demonstrate proper unsoldering techniques--axial lead components.
03.10 Demonstrate proper soldering techniques--radial lead components.
03.11 Demonstrate proper unsoldering techniques--radial lead components.
03.12 Demonstrate proper soldering techniques--flat pack components.
03.13 Demonstrate proper unsoldering techniques--flat pack components.
03.14 Demonstrate proper soldering techniques--integrated circuit components.
03.15 Demonstrate proper unsoldering techniques--integrated circuit components.
03.16 List and discuss applicable Military Soldering Standards.
03.17 List and discuss applicable NASA Soldering Standards.
03.18 List and discuss applicable Weapons-grade Soldering Standards.
03.19 Demonstrate the soldering of wires to industrial terminals.
03.20 Demonstrate the unsoldering of wires from industrial terminals.
03.21 Discuss ground planes on multi-layer printer circuit boards.
03.22 Demonstrate basic blue print reading.
03.23 Demonstrate the techniques used for cable fabrication.
03.24 Demonstrate basic cable lacing techniques.
03.25 Demonstrate shielded cable preparation.
03.26 Demonstrate cable connector preparation.
03.27 Demonstrate cable breakout to grounds.
03.28 Demonstrate cable "Y" splitting.
03.29 Demonstrate cable "T" splitting.
03.30 Demonstrate the repair of water-proof cables.
03.31 Demonstrate cable and connector potting techniques.
03.32 Explain the theory of wire-wrap connections.
03.33 Demonstrate wire-wrap connections.
03.34 Explain the theory of PC board construction.
03.35 Describe the methods and procedures used for PC board repair.
03.36 Demonstrate cable and connector potting techniques.
03.37 Demonstrate the construction and repair of PC boards with conformal coatings.
03.38 Demonstrate the use of a PC board rework station.
03.39 Explain and demonstrate edge connector plating.
03.40 Explain and demonstrate PC board etching techniques.

04.0 DEMONSTRATE PROFICIENCY IN THE BASICS OF ENGINEERING MACHINE PRACTICES. The student will be able to:

04.01 Demonstrate the use of proper terminology in the machine shop trade.
04.02 Demonstrate safe procedures in the machine shop.
04.03 Analyze the operation of the engine lathe.
04.04 Demonstrate the use of the engine lathe.
04.05 Analyze the operation of the milling machine.
04.06 Demonstrate the use of the milling machine.
04.07 Analyze the operation of the horizontal saw.
04.08 Demonstrate the use of the horizontal saw.
04.09 Analyze the operation of the vertical saw.
04.10 Demonstrate the use of the vertical saw.
04.11 Analyze the operation of the drill press.
04.12 Demonstrate the use of the drill press.
04.13 Demonstrate the care and use of precision measuring tools and gages.
04.14 List and define the terminology used with screw thread fabrication.
04.15 Analyze and apply the formulae used for the construction of threads.
04.16 Demonstrate safe work habits and good housekeeping procedures in industrial manufacturing.

05.0 DEMONSTRATE PROFICIENCY IN THE BASICS OF ENGINEERING GRAPHICS. The

student will be able to:

05.01 Demonstrate the use of basic drawing instruments.
05.02 Demonstrate basic lettering techniques.
05.03 Define the terms of importance in technical drawing.
05.04 Demonstrate basic geometric construction techniques.
05.05 Use freehand drawing to express basic ideas and to clarify and amplify concepts.
05.06 Demonstrate the use of multiview projection to provide a shape description of an object.
05.07 Demonstrate the use of sectional views to show interior parts of a complicated structure.
05.08 Use auxiliary views revolution to show true circular shapes.
05.09 Convert dimensions between ANSI and ISO systems.
05.10 Describe the use of tolerancing to insure the accurate fitting of interchangeable parts.
05.11 Draw standard screw threads, fasteners, and springs.
05.12 Describe the use of graphics to create, record, analyze, and communicate to others design concepts or ideas.
05.13 Demonstrate the use and application of pictorial drawings.
05.14 Demonstrate the use of oblique projection.
05.15 Demonstrate the use of perspective drawings.
05.16 Demonstrate the use of the basic concepts of descriptive geometry.
05.17 Define and demonstrate the use of parallelism and perpendicularity.
05.18 Construct drawings that demonstrate the use of intersections.
05.19 Describe the use of engineering graphics in cartography, geology, and spherical geometry.
05.20 Demonstrate the use of graphical vector analysis in the solution of problems using engineering data.

06.0 DEMONSTRATE PROFICIENCY IN THE USE OF WORD PROCESSING, SPREADSHEETS AND DATA MANAGEMENT SYSTEMS USING MICROCOMPUTERS. The student will be able to:

06.01 Describe the component parts of a microcomputer system.
06.02 Explain the operation of a basic microcomputer.
06.03 Demonstrate the operation of the Disk Operating System (DOS).
06.04 Demonstrate the use of basic DOS commands.
06.05 Load a word processing applications program (WordPerfect).
06.06 Create a word processor document.
06.07 Demonstrate the use of the special features of the word processor.
06.08 Modify a word processor document.
06.09 Demonstrate the use of formatting functions, file management, and macros.
06.10 Demonstrate the use of advanced WordPerfect functions.
06.11 Build a worksheet document using VP-Planner Plus.
06.12 Format and print a worksheet.
06.13 Use advanced enhancement functions with the worksheet.
06.14 Build worksheets with functions and macros.
06.15 Demonstrate the use of the worksheet graphing functions.
06.16 Sort and query a worksheet database.
06.17 Create and display a database using dBase III Plus.
06.18 Display records in a database.
06.19 Demonstrate sorting and report preparation.
06.20 Demonstrate adding, changing, and deleting records.
06.21 Demonstrate changing the database structure.
06.22 Utilize commercially available software to generate computer graphics.

07.0 DEMONSTRATE PROFICIENCY IN THE FUNDAMENTAL CONCEPTS OF QUALITY ASSURANCE. The student will be able to:

07.01 Describe the history of inspection, quality control, quality assurance, and system effectiveness.
07.02 List relevant quality organizations.
07.03 Define the terms used in the field of quality assurance.
07.04 Describe the components and organization of the basic quality system.
07.05 Describe the design concepts used to insure system quality, reliability, and maintainability.
07.06 Describe the test requirements needed to insure system reliability.
07.07 Define configuration management.
07.08 Describe the implementation of a materials control management system.
07.09 Describe the role of quality assurance in tool engineering.
07.10 Describe and list proper inspection methods.
07.11 Introduce the use of statistical quality control.
07.12 Describe the basic concepts of non-destructive testing.
07.13 Show the interdependence between quality assurance and metrology.
07.14 List the costs of a proper quality control program.
07.15 Show the relationship between quality control, consumerism, and liability.
07.16 Describe the importance of record keeping.
07.17 Explain the basic concepts of a proper management system.

08.0 DEMONSTRATE PROFICIENCY IN MODERN QUALITY ASSURANCE INSPECTION TECHNIQUES. The student will be able to:

08.01 Define the terms used in modern inspection techniques.
08.02 Explain definitions of specifications and tolerances.
08.03 Discuss measurement methods used in the past and present.
08.04 Discuss the inspection methods to be used in the future.
08.05 Describe the purposes of fixed gages.
08.06 Explain the types of fixed gages.
08.07 Discuss the purposes of mechanical indicating devices.
08.08 Explain the types of mechanical indicating devices.
08.09 Discuss the purposes of electrical indicating devices.
08.10 Explain the types of electrical indicating devices.
08.11 Discuss the purposes of optical measurement equipment.
08.12 Explain the types of optical measurement equipment.
08.13 Explain the purpose of a calibration program.
08.14 Discuss the calibration of mechanical devices.
08.15 Discuss the calibration of electrical devices.
08.16 Discuss the calibration of optical devices.
08.17 Explain precision measurements.
08.18 Discuss differences between precision measurements and other measurements.
08.19 Discuss automated and manual measurements.
08.20 Define Nondestructive Testing and uses of NDT in inspection.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 **DEMONSTRATE APPROPRIATE MATH SKILLS** -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 **DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE** -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 **DEMONSTRATE EMPLOYABILITY SKILLS**--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 **DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP**--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Stationary Energy Systems

CODE NUMBER: Secondary ______ Postsecondary I470501

Florida CIP 0647.050100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: STA ENGR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as stationary engineers (95032903), (950.382-026), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the operation and maintenance of large power sources used for purposes as generating electricity, pumping, and heating and cooling.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the operation of various types of power plant equipment including stationary engines, boilers, pumps, compressors, motors and generators used to provide heat, refrigeration, power and other utility services in buildings or for industrial processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform refrigeration engineer activities.
02. Perform stationary engineer duties.
03. Perform boiler room duties.
04. Detect and correct operational malfunctions.
05. Demonstrate appropriate communication skills.
06. Demonstrate appropriate math skills.
07. Demonstrate appropriate understanding of basic science.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Stationary Energy Systems POSTSECONDARY NUMBER: 1470501

01.0 PERFORM REFRIGERATION ENGINEER ACTIVITIES--The student will be able to:

01.01 Operate freon, carbon-dioxide, and ammonia gas cooling systems.
01.02 Open valves on equipment.
01.03 Start up equipment and auxiliary machinery.
01.04 Observe temperature and ampere reading.
01.05 Adjust controls to specifications.
01.06 Perform override of automatic controls.
01.07 Maintain operational logs.
01.08 Measure density of brine using hydrometer.
01.09 Lower temperature to specified degree.
01.10 Connect hoses.
01.11 Inspect and maintain equipment.
01.12 Operate hand tools.

02.0 PERFORM STATIONARY ENGINEER DUTIES--The student will be able to:

02.01 Operate steam engines, air compressors, generators, motors, turbines and steam boilers.
02.02 Interpret meters and gauges.
02.03 Record operational data for fuel consumption, temperature, levels, gases, load, and balance.
02.04 Adjust manual controls as needed.
02.05 Operate back-up equipment.
02.06 Repack bearings as needed.
02.07 Replace gaskets, valves and gauges.
02.08 Clean burners and other components.
02.09 Use hand and power tools.
02.10 Oil and lubricate equipment as needed.
02.11 Perform water titration tests as needed.

03.0 PERFORM BOILER ROOM DUTIES--The student will be able to:

03.01 Operate fire boilers to generate steam.
03.02 Operate torch to light burners.
03.03 Grind and fee coal as necessary.
03.04 Operate pulverizer and stoker.
03.05 Observe pressure and draft meters.
03.06 Operate diesel-electric generating unit.
03.07 Start diesel engine.
03.08 Synchronize generators with other power sources.
03.09 Tighten pipes and fittings.
03.10 Treat boiler feed water.

04.0 DETECT AND CORRECT OPERATIONAL MALFUNCTIONS--The student will be able to:

04.01 Monitor gauges, meters, warning lights and alarms.
04.02 Identify function of warning devices.
04.03 Make minor adjustments as needed.
04.04 Check output efficiency of system.
04.05 Verify flow rates as needed.

05.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

05.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
05.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
05.03 Read and follow written and oral instructions.
05.04 Answer and ask questions coherently and concisely.
05.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
05.06 Demonstrate appropriate telephone/communication skills.

06.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

06.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.

06.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
06.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
06.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
06.05 Demonstrate an understanding of federal, state and local taxes and their computation.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

07.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
07.02 Draw conclusions or make inferences from data.
07.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
07.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make appropriate job changes.
08.09 Demonstrate acceptable employee health habits.
08.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful

entrepreneur.

09.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Structural Steel Work

CODE NUMBER: Secondary _______ Postsecondary I480519

Florida CIP 0648.059902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G STRL STEEL @ 7 G
¶BLDG CONST @ 7 G METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a structural metal worker (87814564), ironworker (801.361-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, direct hands-on training procedure with cranes, rigging and direct placement of structural and rebar steel.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safety, use of blueprints, cutting, welding, and placement of rebar.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Erect ornamental iron.
02. Fabricate reinforcing steel.
03. Erect structural steel.
04. Perform rigging operations.
05. Perform reeving operations.
06. Identify proper sling use.
07. Perform heavy rigging.
08. Access structures.
09. Read and interpret blueprints.
10. Perform welding operations.
11. Erect steel fences.
12. Apply metal decking.
13. Identify proper use of fiber line.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Industrial SECONDARY NUMBER: ________
PROGRAM TITLE: Structural Steel Work POSTSECONDARY NUMBER: I480519

01.0 ERECT ORNAMENTAL IRON--The student will be able to:

01.01 Understand the use of squares, levels, transits, rulers and other tools for preparing layout work.
01.02 Identify various types of doors and frames that are used in iron working.
01.03 Demonstrate how to erect doors and frames.
01.04 Identify types of gratings and grills and methods of installing them.
01.05 Identify types of handrails and methods of installing them.
01.06 Identify types of stairways and rails and methods of installing them.

02.0 FABRICATE REINFORCING STEEL--The student will be able to:

02.01 Fabricate reinforcing steel.
02.02 Erect, place and tie reinforcing steel.

03.0 ERECT STRUCTURAL STEEL--The student will be able to:

03.01 Identify various connections of beams, columns, and any other structural members.
03.02 Execute connections of beams, columns, and other structural members.
03.03 Execute proper method of hooking steel beams and columns for hoisting in building erection.
03.04 Demonstrate correct hand signals for all cranes, derricks and gin poles.
03.05 Assemble various types of cranes, derrick and gin poles.
03.06 Identify types of splices used for all phases of wire rope.
03.07 Demonstrate all types of splicing for wire rope.

04.0 PERFORM RIGGING OPERATIONS--The student will be able to:

04.01Identify rigging hardware.
04.02 Describe and demonstrate, when possible, rigging applications.

05.0 PERFORM REEVING OPERATIONS--The student will be able to:

05.01 Identify different types of blocks and their safe working load.
05.02 Compute the mechanical advantages of compound tackle systems.
05.03 Reeve and lace wire rope through the blocks and sheaves.

06.0 IDENTIFY PROPER SLING USE--The student will be able to:

06.01 Identify types of slings.
06.02 Identify practical uses of slings.

07.0 PERFORM HEAVY RIGGING--The student will be able to:

07.01 Identify center of gravity and picking points for heavy loads.
07.02 Identify methods to hoist heavy loads correctly into place.

08.0 ACCESS STRUCTURES--The student will be able to:

08.01 Identify access structures.
08.02 Identify methods of rigging access structures.

09.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

09.01 Identify types of blueprints.
09.02 Identify blueprint symbols, abbreviations, markings and details.
09.03 Identify control and measurement lines.
09.04 Understand the translation from blueprint to practical use.

10.0 PERFORM WELDING OPERATIONS--The student will be able to:

10.01 Identify types of welds.
10.02 Identify types of welding machines, rods and wires.
10.03 Demonstrate practical application of various types of welding procedures on ferrous and non-ferrous metals to enable students to pass welding certification tests.
10.04 Understand the principles of free-standing towers and guy towers and the methods of erecting them.

11.0 ERECT STEEL FENCES--The student will be able to:

11.01 Layout steel fences.
11.02 Erect steel fences.

12.0 APPLY METAL DECKING--The student will be able to:

12.01 Identify various types of metal decking and sheeting.
12.02 Understand proper handling of placing of metal decking sheeting.
12.03 Demonstrate proper placing or erection techniques for metal decking and sheeting.

13.0 IDENTIFY PROPER USE OF FIBER LINE--The student will be able to:

13.01 Identify all types of fiber line,
13.02 Understand the effects of climate on fiber line.
13.03 Identify various types of knots, their uses, and advantages and disadvantages.
13.04 Demonstrate various splices, knots, bends and hitches.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.

15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Surveying and Mapping Technology

CODE NUMBER: Secondary ______ Postsecondary I150203

Florida CIP 0615.020300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G SURVEY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a surveying and mapping technician (22521071), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, record keeping skills and mathematics, and use of surveying equipment to perform measurement activities.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in chaining, rod and level activities, angle measurement, electronic distance measurement, land surveying and construction layout.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1980 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Measure land using chains and tape.
02. Perform rod and level activities.
03. Perform angle measurement activities.
04. Perform electronic distance measurement activities.
05. Perform land surveying activities.
06. Perform construction stake out activities.
07. Perform supervisory functions.
08. Determine methods and procedures for establishing survey control.
09. Develop sketches and drawings.
10. Research previous survey evidence.
11. Compute volumes and areas.
12. Read, interpret, and write descriptions of land.
13. Prepare charts and tables.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate math skills.
16. Demonstrate appropriate understanding of basic science.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Surveying and Mapping Technology POSTSECONDARY NUMBER: I150203

01.0 MEASURE LAND USING CHAINS AND TAPE--The student will be able to:

01.01 Clear brush to establish line of sight.
01.02 Hold the chain/tape over a point.
01.03 Pull the chain/tape.
01.04 Wind the chain/tape on reel.
01.05 Set the marker.
01.06 Loop and throw the unreeled chain/tape.
01.07 Establish a line perpendicular to an existing line at a given point using a right angle prism.
01.08 Establish elevation using a hand (Locke) level.
01.09 Test and standardize the chain/tape.

02.0 PERFORM ROD AND LEVEL ACTIVITIES--The student will be able to:

02.01 Plumb the rod.
02.02 Obtain a rod reading using a target.
02.03 Obtain a rod reading with using a target.
02.04 Establish a turning point/benchmark.
02.05 Set up the level.
02.06 Test the level.

03.0 PERFORM ANGLE MEASUREMENT ACTIVITIES--The student will be able to:

03.01 Set up a transit/theodolite over a point.
03.02 Measure a horizontal angle.
03.03 Measure a vertical angle.
03.04 Lay out a horizontal angle.
03.05 Lay out a vertical angle.
03.06 Read a compass bearing.
03.07 Adjust transit/theodolite leveling bubbles.
03.08 Adjust transit/theodolite vertical cross-hair by double centering.
03.09 Adjust transit/theodolite vertical cross-hair for vertical accuracy.

04.0 PERFORM ELECTRONIC DISTANCE MEASUREMENT ACTIVITIES--The student will be able to:

04.01 Test accuracy of instrument against a known point.
04.02 Set up EDM.
04.03 Obtain scope distance and compute horizontal distance.
04.04 Set up reflector.

05.0 PERFORM LAND SURVEYING ACTIVITIES--The student will be able to:

05.01 Determine horizontal distance by the stadia method.
05.02 Determine elevation by the stadia method.
05.03 Locate detail be angle and distance using a transit/theodolite.
05.04 Locate detail by the use of a plane table and alidade.
05.05 Establish property corners from deed descriptions or plat.
05.06 Secure a deed from the courthouse.

06.0 PERFORM CONSTRUCTION STAKE OUT ACTIVITIES--The student will be able to:

06.01 Establish horizontal control.
06.02 Establish vertical control.
06.03 Stake out horizontal curves.
06.04 Determine elevations for vertical curves.
06.05 Establish slope stakes.

07.0 PERFORM SUPERVISORY FUNCTIONS--The student will be able to:

07.01 Demonstrate equipment use.
07.02 Inventory field supplies and equipment.
07.03 Select equipment.
07.04 Evaluate personnel
07.05 Schedule work.
07.06 Perform mathematical checks on field work.
07.07 Keep field notes.

08.0 DETERMINE METHODS AND PROCEDURES FOR ESTABLISHING SURVEY CONTROL--The student will be able to:

08.01 Understand and apply methods of distance measurements.
08.02 Understand and apply methods of angle measurements.
08.03 Understand and apply azimuth determination.
08.04 Understand and apply closure computations.
08.05 Understand and apply adjustment of data.

09.0 DEVELOP SKETCHES AND DRAWINGS--The student will be able to:

09.01 Make lettering sketches to identify items.
09.02 Demonstrate inking procedures.
09.03 Identify map symbolism.
09.04 Define and interpret dimensioning.
09.05 Write a brief but adequate property description.

10.0 RESEARCH PREVIOUS SURVEY EVIDENCE--The student will be able to:

10.01 Be familiar with courthouse procedures.
10.02 Conduct a title search.
10.03 Demonstrate an understanding of deeds.
10.04 Search for record evidence.
10.05 Demonstrate proper resurvey processes.

11.0 COMPUTE VOLUMES AND AREAS--The student will be able to:

11.01 Compute an area by using trapezoids
11.02 Compute an area by using coordinates.
11.03 Compute an area of a curved surface.
11.04 Compute volumes of linear dimension surfaces.
11.05 Compute volumes of curved surfaces.

12.0 READ, INTERPRET, AND WRITE DESCRIPTIONS OF LAND--The student will be able to:

12.01 Prepare metes and bounds descriptions.
12.02 Understand the U.S. Public Land Survey System.
12.03 Understand and interpret sectionalized surveys.
12.04 Understand and interpret sectional breakdowns.
12.05 Understand and interpret standard deed information.

13.0 PREPARE CHARTS AND TABLES--The student will be able to:

13.01 Understand and prepare curve information.
13.02 Understand and prepare highway design information.

13.03 Understand and prepare standard control information.
13.04 Understand and prepare proper field notes.
13.05 Understand and prepare proper legend information.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

15.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
15.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
15.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
15.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
15.05 Demonstrate an understanding of federal, state and local taxes and their computation.

16.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

16.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
16.02 Draw conclusions or make inferences from data.
16.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
16.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make appropriate job changes.
17.09 Demonstrate acceptable employee health habits.
17.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Swimming Pool Maintenance

CODE NUMBER: Secondary ___ ___ Postsecondary I469939

Florida CIP 0646.999903

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____7-9 ____9-12 x Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: POOL MAINT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as a maintenance repairer (85132625), swimming pool servicer (891.684-018), or to provide supplemental training for persons previously or currently employed in this occupational area.

The content should include, but not be limited to, the safety storage, and handling of pool maintenance tools, equipment, and supplies; disease and Florida State Board of Health regulations; pool circulation and recirculation equipment; filters and filtration; required mathematics for swimming pool calculations; acid/base chemistry; alkalinity and hardness; water sanitizing and control agents; chlorinators and the chemistry of chlorination; bactericides stabilizers and other pool chemicals; water testing; swimming pool and spa maintenance; spas, hot tubs, and therapy pools; pool, spa, hot tub, and therapy pool problems; pool management and operation; energy conservation, management, and solar energy; occupational information; entrepreneurship; and employability skills.

II. LABORATORY ACTIVITIES: Instruction is provided in a realistic setting using hands-on experiences with the tools, equipment, and materials appropriate to the program content and in accordance with current practices in industry and governmental regulations.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program. This program may be offered to meet the needs of local employers and licensing requirements. A minimum of 40 classroom hours is usually required.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the safe storage and use of pool and spa tools, equipment, and supplies.
02. Identify pool and spa related diseases and their prevention.
03. Identify and understand Florida State Board of Health (SBOH) regulations related to pool and spas.
04. Identify the major components of a circulation system and their general construction, function, and proper circulation in a pool.
05. Identify major types of filters, along with their construction and the function of their components.
06. Demonstrate competency in the mathematical operations required in swimming pool calculations.
07. Identify the characteristics of acid/base and other chemical interactions in water and their identification in chemical terms.
08. Identify alkalinity and "hardness" in water.
09. Identify the types and characteristics of chlorinators.
10. Identify the characteristics and the chemistry of chlorine in relation to swimming pools.
11. Identify the characteristics of bactericides and stabilizers.
12. Perform water tests.
13. Identify other pool chemicals along with their functions and applications.
14. Perform swimming pool maintenance.
15. Perform special maintenance for spas, hot tubs, and therapy pools.
16. Identify common problems and appropriate solutions for pools, spas, hot tubs, and therapy pools.
17. Identify correct principles of energy conservation and management, including the use of solar energy.
18. Identify common occupations found in the swimming pool and spa industry, along with their occupational requirements and availability, and the possibilitites of owning a business in the industry.
19. Demonstrate appropriate communication skills.
20. Demonstrate appropriate math skills.
21. Demonstrate appropriate understanding of basic science.
22. Demonstrate employability skills.
23. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Swimming Pool Maintenance POSTSECONDARY NUMBER: I469939

01.0 DEMONSTRATE THE SAFE STORAGE AND USE OF POOL AND SPA TOOLS, EQUIPMENT, AND SUPPLIES--The student will be able to:

01.01 Identify swimming pool maintenance tools and equipment by name and function.
01.02 Demonstrate proper and safe handling of tools, equipment, and supplies so as to protect the user and others from fire, electrical shock, and other injuries.
01.03 Identify possible injury which can be caused by improper storage or use of pool/spa chemicals and other materials.
01.04 Demonstrate proper care and storage and use of pool/spa supplies.

02.0 IDENTIFY POOL- AND SPA-RELATED DISEASES AND THEIR PREVENTION--The student will be able to:

02.01 Identify pool/spa conditions which may cause disease.
02.02 Select appropriate remedies for pool/spa conditions which might cause diseases.

03.0 IDENTIFY AND UNDERSTAND FLORIDA STATE BOARD OF HEALTH (SBOH) REGULATIONS RELATED TO POOLS AND SPAS--The student will be able to:

03.01 Apply SBOH regulations governing water quality in public pools.
03.02 Apply SBOH requirements for recirculation; piping and hydraulics; filters; chemical feeders; hydrotherapy, whirlpools, spas, and wading pools; diving areas; lighting; bathing load; and spectators related to public pools.
03.03 Identify the function of an inspection by the Health Department and the consequences of noncompliance.

04.0 IDENTIFY THE MAJOR COMPONENTS OF A CIRCULATION SYSTEM AND THEIR GENERAL CONSTRUCTION, FUNCTION, AND PROPER CIRCULATION IN A POOL--The student will be able to:

04.01 Identify the major components of a standard circulation system and the function of each component.
04.02 Identify the major subcomponents (of each component) in a standard circulation system and the purpose of each.
04.03 Identify the function of each of the following pieces of recirculation equipment: flow rate meter and bypass; gauges; valves; surge tanks; and hair and lint strainers.
04.04 Identify proper circulation in a swimming pool.
04.05 Identify a centrifugal pump and curve.

05.0 IDENTIFY MAJOR TYPES OF FILTERS, ALONG WITH THEIR CONSTRUCTION AND THE FUNCTION OF THEIR COMPONENTS--The student will be able to:

05.01 Identify and describe the unique characteristics of sand, diatomaceous earth, and cartridge filters.
05.02 Identify the significance of gravity, rapid flow, and high rate in a sand filter.
05.03 Identify the significance of pressure and a vacuum in a diatomaceous earth filter.

06.0 DEMONSTRATE COMPETENCY IN MATHEMATICAL OPERATIONS REQUIRED IN SWIMMING POOL CALCULATIONS--The student will be able to:

06.01 Calculate the volume of water.
06.02 Calculate filter surface area.
06.03 Calculate pool capacity.
06.04 Calculate turnover rate.
06.05 Calculate flow rate and convert to gallons per minute.
06.06 Calculate swimmer load.
06.07 Calculate pool leaks and make-up water.
06.08 Calculate chemical dosage.
06.09 Calculate temperature conversion.

07.0 IDENTIFY THE CHARACTERISTIC OF ACID/BASE AND OTHER CHEMICAL INTERACTIONS IN WATER AND THEIR IDENTIFICATION IN CHEMICAL TERMS--The student will be able to:

07.01 Identify the concept pH in terms of acids and bases present in water.
07.02 Identify the proper procedure for controlling the balance between acids and bases in water.
07.03 Identify the relationship of chlorine and pH in water.
07.04 Identify corrosion, state how it occurs, and list the varieties of corrosion and galvanic series.
07.05 Demonstrate methods to prevent or retard corrosion.

08.0 IDENTIFY ALKALINITY AND "HARDNESS" IN WATER--The student will be able to:

08.01 Identify alkalinity in pool water.
08.02 Identify permanent and temporary alkalinity.
08.03 Demonstrate procedures for control of total alkalinity.

09.0 IDENTIFY THE TYPES OF CHARACTERISTICS OF CHLORINATORS--The student will be able to:

09.01 Identify the distinguishing characteristics of a hypochlorinator.
09.02 Identify the distinguishing characteristics of a gas chlorinator.
09.03 Identify the distinguishing characteristics of an erosion feed chlorinator.

10.0 IDENTIFY THE CHARACTERISTICS AND THE CHEMISTRY OF CHLORINE IN RELATION TO SWIMMING POOLS--The student will be able to:

10.01 Identify the products of chlorine combined with other substances in pool water.
10.02 Identify residual chlorine in pool water.
10.03 Identify the characteristics of solution chlorine.
10.04 Identify the characteristics of chlorine in the form of a gas.
10.05 Identify the characteristics of chlorine in powder form.
10.06 Identify the distinguishing characteristics of chloramines.
10.07 Identify the effects of the sun on chlorine in pool water.

11.0 IDENTIFY THE CHARACTERISTICS OF BACTERICIDES AND STABILIZERS--The student will be able to:

11.01 Identify the effects of bromine and bromides and the chemical interactions with other substances in pool water.
11.02 Identify the effects of iodine and the chemical interactions with other substances in pool water.
11.03 Identify other commonly used methods of sanitation.

12.0 PERFORM WATER TESTS--The student will be able to:

12.01 Identify commonly used water test kits and their distinguishing

characteristics.
12.02 Test for free chlorine and take appropriate action.
12.03 Conduct the cyanuric test and take appropriate action.
12.04 Test for total alkalinity and take appropriate action.
12.05 Conduct other commonly used water tests.

13.0 IDENTIFY OTHER POOL CHEMICALS, ALONG WITH THEIR FUNCTIONS AND APPLICATIONS--The student will be able to:

13.01 Identify commonly used algaecides and their functions.
13.02 Demonstrate proper procedures for applying algaecides.
13.03 Identify commonly used flocculents and their functions.
13.04 Demonstrate proper procedures for applying flocculents.
13.05 Identify common sequestering agents and their functions.
13.06 Demonstrate the proper procedure for applying sequestering agents.

14.0 PERFORM SWIMMING POOL MAINTENANCE--The student will be able to:

14.01 Inspect and clean pool surface.
14.02 Inspect and clean or repair a pool deck.
14.03 Inspect and clean or repair water barriers.
14.04 Inspect and clean or repair pool walls, troughs, and skimmers.
14.05 Inspect and clean or repair a pool bottom.
14.06 Inspect and clean/repair or replace a diving board and slide.
14.07 Inspect and clean or repair lights.
14.08 Inspect and service a filter pump.
14.09 Inspect, remove, and replace motors.
14.10 Inspect and clean or repair a hair and lint strainer.
14.11 Inspect and replace pressure gauges.
14.12 Inspect and service, clean, or repair a chemical feeder.
14.13 Inspect and service or repair gas and other chlorinators.
14.14 Inspect and service or repair a water heater.
14.15 Inspect and clean or repair a valve.

15.0 PERFORM SPECIAL MAINTENANCE FOR SPAS, HOT TUBS, AND THERAPY POOLS--The student will be able to:

15.01 Identify and control bacterial growth, including pseudomona aeruginosa.
15.02 Measure and adjust the chlorine level.
15.03 Inspect and adjust circulation.
15.04 Identify hyperthermia and preventive action with timer.
15.05 Identify and correct hair entrapment and entanglement.
15.06 Install appropriate warning and safety signs.
15.07 Select appropriate heater size.
15.08 Demonstrate appropriate record keeping.

16.0 IDENTIFY COMMON PROBLEMS AND APPROPRIATE SOLUTIONS FOR POOLS, SPAS, HOT TUBS, AND THERAPY POOLS--The student will be able to:

16.01 Identify and correct common hydraulic problems.
16.02 Identify and correct common electrical problems.
16.03 Identify and correct common mechanical problems.
16.04 Identify and correct common temperature problems.
16.05 Identify and correct common humidity problems.
16.06 Identify and correct common pool shell problems.
16.07 Identify and correct common water clarity problems.
16.08 Identify and correct common pool water problems.
16.09 Identify and correct common filter problems.

17.0 IDENTIFY CORRECT PRINCIPLES OF ENERGY CONSERVATION AND MANAGEMENT, INCLUDING THE USE OF SOLAR ENERGY--The student will be able to:

17.01 Identify types and factors affecting heat loss.
17.02 Identify appropriate situations for the use of a pool blanket.
17.03 Identify and perform appropriate procedures for conserving energy through circulation, filtration, lighting, heating, pool shelters, and using the swimming season.
17.04 Identify and install appropriate solar collectors.

18.0 IDENTIFY COMMON OCCUPATIONS FOUND IN THE SWIMMING POOL AND SPA INDUSTRY, ALONG WITH THEIR OCCUPATIONAL REQUIREMENTS AND AVAILABILITY, AND THE POSSIBILITIES OF OWNING A BUSINESS IN THE INDUSTRY--The student will be able to:

18.01 Identify the requirements and availability of certified swimming pool and spa maintenance contractor jobs.
18.02 Identify the requirements for going into business as a certified swimming pool maintenance contractor.
18.03 Identify the requirements for being certified (at municipal, county, and/or state level(s) as a pool operator.

19.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

19.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
19.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
19.03 Read and follow written and oral instructions.
19.04 Answer and ask questions coherently and concisely.
19.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
19.06 Demonstrate appropriate telephone/communication skills.

20.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

20.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
20.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
20.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
20.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
20.05 Demonstrate an understanding of federal, state and local taxes and their computation.

21.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

21.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
21.02 Draw conclusions or make inferences from data.
21.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
21.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

22.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

22.01 Conduct a job search.
22.02 Secure information about a job.

22.03 Identify documents which may be required when applying for a job interview.
22.04 Complete a job application form correctly.
22.05 Demonstrate competence in job interview techniques.
22.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
22.07 Identify acceptable work habits.
22.08 Demonstrate knowledge of how to make job changes appropriately.
22.09 Demonstrate acceptable employee health habits.
22.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

23.01 Define entrepreneurship.
23.02 Describe the importance of entrepreneurship to the American economy.
23.03 List the advantages and disadvantages of business ownership.
23.04 Identify the risks involved in ownership of a business.
23.05 Identify the necessary personal characteristics of a successful entrepreneur.
23.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Technical Illustration

CODE NUMBER: Secondary ______   Postsecondary I500403

Florida CIP 0650.040300

SECONDARY SCHOOL CREDITS ______   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ____ 7-9   ____ 9-12   x Postsecondary Adult Vocational

____ Postsecondary Vocational   x Other 30, 31

CERTIFICATION COVERAGE: PRINTING @ 7 G   COMM ART @ 7 G   ¶BLDG CONST @ 7 G
¶TEC CONSTR @ 7 G   TEC DRAFT @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a technical illustrator (017.281-034), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading skills, freehand technical sketching, advanced perspective drawings, true-position drawing skills, rendering and shadow projection techniques, inking and lettering skills, electronic drawings, airbrush illustration skills, and technical mathematics.

II. LABORATORY ACTIVITIES: Laboratory activities include development of sketches, perspective drawings and application of basic drafting skills to produce full color technically oriented illustrations.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 9.0, Reading 10.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints.
02. Prepare freehand technical sketches.
03. Prepare perspective drawings.
04. Apply true-position drafting skills.
05. Prepare dimensioned drawings in true-position.
06. Apply rendering and shadow projection techniques.
07. Apply inking and lettering skills.
08. Prepare electronic drawings.
09. Prepare full color illustrations.
10. Prepare airbrush illustrations.
11. Prepare a technical illustration project.
12. Prepare a portfolio.
13. Apply technical mathematics.
14. Demonstrate appropriate communication skills.
15. Demonstrate appropriate understanding of basic science.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Technical Illustration POSTSECONDARY NUMBER: I500403

01.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

01.01 Read and interpret detail shop drawings.
01.02 Read and interpret assembly drawings.
01.03 Read and interpret sectioned drawings.
01.04 Read and interpret dimensions with fraction, decimal and metric tolerances.
01.05 Read and interpret data in title blocks, material and parts lists.

02.0 PREPARE FREEHAND TECHNICAL SKETCHES--The student will be able to:

02.01 Prepare orthographic sketches.
02.02 Prepare black and white rendered sketches.
02.03 Prepare colored rendered sketches.

03.0 PREPARE PERSPECTIVE DRAWINGS--The student will be able to:

03.01 Prepare one-point perspective drawings.
03.02 Prepare two-point measured perspective drawings.
03.03 Prepare three-point measured perspective drawings.

04.0 APPLY TRUE-POSITION DRAFTING SKILLS--The student will be able to:

04.01 Prepare foreshortening skills.
04.02 Prepare elliptical circle diagrams.
04.03 Prepare drawings using isometric drafting instruments.
04.04 Prepare drawings using dimetric drafting instruments.
04.05 Prepare drawings using trimetric drafting instruments.
04.06 Prepare drawings with oblique lines and planes in true-position.
04.07 Measure drawings using the oblique line scaler.
04.08 Prepare true-position drawings for gears and splines.
04.09 Prepare true-position drawings for helixes and compound curves and angles.

05.0 PREPARE DIMENSIONED DRAWINGS IN TRUE-POSITION--The student will be able to:

05.01 Prepare drawings with undirectional and planar dimensions.
05.02 Prepare drawings with tabular dimensions.
05.03 Prepare drawings with coordinate or datum dimensions.
05.04 Prepare drawings with geometric symbols and tolerances.

06.0 APPLY RENDERING AND SHADOW PROJECTION TECHNIQUES--The student will be able to:

06.01 Prepare drawings in color using high-lights.
06.02 Prepare drawings using orthographic shadow projection.
06.03 Prepare drawings using 3-dimensional shadow projection.

07.0 APPLY INKING AND LETTERING SKILLS--The student will be able to:

07.01 Use technical pens.
07.02 Use the Leroy lettering set.
07.03 Use the WRICO lettering guide.
07.04 Use speed-ball lettering pen points.

07.05 Prepare true-position drawings in ink on vellum and mylar surfaces.
07.06 Prepare freehand technical sketches in ink.

08.0 PREPARE ELECTRONIC DRAWINGS--The student will be able to:

08.01 Identify and apply electronic symbols to diagrams and drawings.
08.02 Prepare schematic diagrams.
08.03 Prepare pictorial drawings in color.
08.04 Prepare printed circuit board drawings.

09.0 PREPARE FULL COLOR ILLUSTRATIONS--The student will be able to:

09.01 Identify and apply primary, secondary and complementary colors.
09.02 Prepare a simple color-wheel chart.
09.03 Prepare illustrations using water colors and brushes.
09.04 Prepare illustrations using color-pencils and pastels.
09.05 Prepare freehand technical sketches in color.

10.0 PREPARE AIRBRUSH ILLUSTRATIONS--The student will be able to:

10.01 Identify and prepare airbrush equipment for operation.
10.02 Prepare dot, line and tone pattern chart.
10.03 Prepare a grade tone chart.
10.04 Prepare friskit and tape masking for airbrush illustrations.
10.05 Prepare a 3-dimensional chart for geometric solids.
10.06 Prepare a selected full color airbrush illustration.

11.0 PREPARE A TECHNICAL ILLUSTRATION PROJECT--The student will be able to:

11.01 Research and select a technical subject (device).
11.02 Prepare appropriate equipment and materials.
11.03 Prepare preliminary sketches and drawings.
11.04 Prepare orthograph and exploded view drawings.
11.05 Prepare full-color presentation of subject.

12.0 PREPARE A PORTFOLIO--The student will be able to:

12.01 Select and purchase appropriate portfolio.
12.02 Select quality drawings and illustration for the portfolio.
12.03 Organize the portfolio for quick and easy presentation.

13.0 APPLY TECHNICAL MATHEMATICS--The student will be able to:

13.01 Solve arithmetic problems.
13.02 Solve algebra problems.
13.03 Solve geometry problems.
13.04 Solve trigonometry problems.

14.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

14.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
14.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
14.03 Read and follow written and oral instructions.
14.04 Answer and ask questions coherently and concisely.
14.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
14.06 Demonstrate appropriate telephone/communication skills.

15.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

15.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
15.02 Draw conclusions or make inferences from data.
15.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
15.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents which may be required when applying for a job interview.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Technical Writing - Publications Technology

CODE NUMBER: Secondary ______ Postsecondary ______

Florida CIP 0623.110100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

x Postsecondary Vocational _____ Other __________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as technical publications writers (34005196), (131.267-016), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and revising, editing, and writing materials for technical and administrative publications concerned with work methods and procedures, and installation, operation, and maintenance of machinery and other equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in developing technically oriented materials through interpretation of processes, blueprints, interviews, and notes. Activities include preparing final script and supporting illustrations to be printed.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures.
02. Develop and write material.
03. Edit technical material.
04. Perform research.
05. Interpret blueprints and schematics.
06. Revise printed materials.
07. Lay out work to be printed.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: __________

PROGRAM TITLE: Technical Writing - Publications Technology
POSTSECONDARY NUMBER: _______

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES--The student will be able to:

01.01 Apply school and class rules and procedures.
01.02 Apply rules and procedures used in business and industry for the occupation.

02.0 DEVELOP AND WRITE MATERIALS--The student will be able to:

02.01 Apply rules of grammar and word usage.
02.02 Use sentences and paragraphs effectively.
02.03 Spell words correctly.
02.04 Write paragraphs exemplifying the qualities of unity and coherence, and using emphasis effectively.
02.05 Identify the need for a publication.
02.06 Define the audience to read a publication.
02.07 Select and rank the topics as appropriate.
02.08 Define the scope of the publication.
02.09 Develop the time frame for development.
02.10 Prepare a budget as necessary.
02.11 Apply standards.
02.12 Review existing literature.
02.13 Determine and consider resources.
02.14 Coordinate the project by maintaining monitoring, and reporting progress.
02.15 Schedule editorial and support services.
02.16 Choose vendors.
02.17 Receive and file source data.
02.18 Develop, revise, and edit drafts.
02.19 Group information into working units.
02.20 Prepare and revise an outline.
02.21 Utilize word processing system.
02.22 Develop a format for a publication.
02.23 Define and standardize terminology.
02.24 Comply with standards and specifications.
02.25 Match the level of vocabulary with the targeted audience.
02.26 Make notes for illustrations.
02.27 Specify types and styles for illustrations.
02.28 Prepare sketches as needed.
02.29 Write figures titles and photograph captions.
02.30 Prepare tables and charts.
02.31 Provide artists with source data.

03.0 EDIT TECHNICAL MATERIAL--The student will be able to:

03.01 Evaluate material for readability and correctness.
03.02 Validate the data.
03.03 Validate the data in illustrations.
03.04 Review and edit illustrations.
03.05 Conduct meetings for feedback, conflict resolution, and evaluation of suggested changes.

04.0 PERFORM RESEARCH--The student will be able to:

04.01 Interview sources of information.

04.02 Study relevant literature.
04.03 Participate hands-on experiences, if applicable.
04.04 Observe or walk through the process(es).
04.05 Use and evaluate models.
04.06 Simulate audience's situation.

05.0 INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

05.01 Apply math skills.
05.02 Read scales and measuring instruments.
05.03 Read and interpret multiview drawings.
05.04 Read and interpret section views and details.
05.05 Read and interpret auxiliary views.
05.06 Read and interpret types of dimensions.
05.07 Read and interpret pictorial drawings.
05.08 Read and interpret supplementary information.
05.09 Read and interpret removable fastener drawings.
05.10 Read and interpret welding drawings.
05.11 Read and interpret geometric tolerances.
05.12 Read and interpret cam drawings.
05.13 Read and interpret gear drawings.
05.14 Read and interpret assembly and subassembly drawings.
05.15 Read and interpret detail drawings.
05.16 Read and interpret surface developments.
05.17 Read and interpret bearing drawings.
05.18 Read and interpret spring drawings.
05.19 Read and interpret casting drawings.
05.20 Read and interpret forging drawings.
05.21 Read and interpret tool drawings.
05.22 Read and interpret stamping drawings.
05.23 Read and interpret numerical control drawings.
05.24 Read and interpret computer aided drawings.
05.25 Read and interpret plot plans.
05.26 Read and interpret foundation plan drawings.
05.27 Read and interpret floor plan drawings.
05.28 Read and interpret elevation drawings.
05.29 Read and interpret schedules.
05.30 Read and interpret stair details.
05.31 Read and interpret fireplace details.
05.32 Read and interpret truss drawings.
05.33 Read and interpret roof framing plans.
05.34 Read and interpret electrical plans.
05.35 Read and interpret plumbing drawings.
05.36 Read and interpret heating/cooling plans.
05.37 Read and interpret landscape layout drawings.
05.38 Read and interpret specifications.
05.39 Read and interpret erection plans.
05.40 Read and interpret structural steel design drawings.
05.41 Read and interpret structural steel drawings.
05.42 Read and interpret concrete engineering drawings.
05.43 Read and interpret placing drawings.
05.44 Read and interpret schematic drawings.
05.45 Read and interpret printed circuit board drawings.
05.46 Read and interpret package drawings.
05.47 Read and interpret connection drawings.
05.48 Read and interpret interconnection drawings.
05.49 Read and interpret wiring lists.
05.50 Read and interpret cable drawings.
05.51 Read and interpret harness drawings.
05.52 Read and interpret component drawings.
05.53 Read and interpret logic diagrams.
05.54 Read and interpret block diagrams.

05.55 Read and interpret cutaway diagrams.
05.56 Read and interpret graphic diagrams.
05.57 Read and interpret combination diagrams.
05.58 Read and interpret traverse drawings.
05.59 Read and interpret plat drawings.
05.60 Read and interpret street layout drawings.
05.61 Read and interpret map drawings.
05.62 Read and interpret topographic drawings.
05.63 Identify construction codes and standards.
05.64 Identify mechanical standards.
05.65 Identify electronic standards.

06.0 REVISE PRINTED MATERIALS--The student will be able to:

06.01 Determine the requirements of the job.
06.02 Estimate the time to complete the job.
06.03 Calculate costs.
06.04 Make changes and rewrite the draft in the required format.

07.0 LAY OUT WORK TO BE PRINTED--The student will be able to:

07.01 Specify typography.
07.02 Prepare dummy copy.
07.03 Paginate the text.
07.04 Paste-up camera-ready copy.
07.05 Make photostats of art (i.e., PMT, velox, photostat).
07.06 Crop and size illustrations.
07.07 Strip and opaque negatives.
07.08 Proofread copy at each stage of production.
07.09 Secure final approvals.
07.10 Prepare a printer's dummy or approval copy.
07.11 Secure estimates from printers.
07.12 Evaluate estimates and prepare a contract.
07.13 Send camera-ready copy to the printer.
07.14 Secure and inspect negatives.
07.15 Inspect printer's work (bluelines, press proofs, or first page).
07.16 Solve problems with the printer.
07.17 Receive, check, and approve for payment the shipment from a printer.
07.18 Coordinate the distribution of print material.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and

whole numbers.

09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.

09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

10.02 Draw conclusions or make inferences from data.

10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.

11.02 Secure information about a job.

11.03 Identify documents which may be required when applying for a job interview.

11.04 Complete a job application form correctly.

11.05 Demonstrate competence in job interview techniques.

11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.

11.07 Identify acceptable work habits.

11.08 Demonstrate knowledge of how to make job changes appropriately.

11.09 Demonstrate acceptable employee health habits.

11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.

12.02 Describe the importance of entrepreneurship to the American economy.

12.03 List the advantages and disadvantages of business ownership.

12.04 Identify the risks involved in ownership of a business.

12.05 Identify the necessary personal characteristics of a successful entrepreneur.

12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Telecommunication Engineering Technology

CODE NUMBER: Secondary ____ _____ Postsecondary

Florida CIP 0615.030302

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS x POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

x Postsecondary Vocational ___ Other _______

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: This program is designed to prepare students for employment as communications engineering technicians or in related occupations, or to provide supplemental training to persons previously or currently employed in these occupations.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program. The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

This specialization content includes, but is not limited to, amplitude and angle modulation systems, transmission lines, antennas, fiber optic systems, digital communications and data communications.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing electronic circuitry.

III. SPECIAL NOTE: As part of an Associate in Science Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for greater knowledge expansion and transference in the future.

This general education requirement must have a minimum of 15 semester hours with at least one course in oral and written communication and one course in computational skills. The computational skills should include algebra and trigonometry.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When content from the Florida common core electronics program (Electronics Technology) is included, the typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in design and analysis of AM transmitters and receivers.
02. Demonstrate proficiency in design and analysis of FM transmitters and receivers.
03. Demonstrate proficiency in the analysis of transmission line systems and antennas.
04. Demonstrate proficiency in the analysis of fiber-optic systems.
05. Demonstrate proficiency in the analysis of digital communication systems.
06. Demonstrate proficiency in the analysis of data communications.
07. Demonstrate proficiency in the analysis of satellite communication systems.
08. Demonstrate proficiency in the analysis of video systems.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial   SECONDARY NUMBER:

PROGRAM TITLE: Telecommunication Engineering Technology   POSTSECONDARY NUMBER:

01.0 DEMONSTRATE PROFICIENCY IN DESIGN AND ANALYSIS OF AM TRANSMITTERS AND RECEIVERS--The student will be able to:

01.01 Describe the operation of amplitude modulation (AM) radio systems.
01.02 Identify the stages of AM transmitters and receivers.
01.03 Define the principles of amplitude modulation.
01.04 Design, analyze and troubleshoot AM transmitter/receiver circuits including mixers, IF amplifiers, local oscillators, modulators, demodulators and speech amplifiers.
01.05 Align Intermediate Frequency (IF) circuits.
01.06 Measure the receiver IF bandwidth.
01.07 Measure the sensitivity of a receiver.
01.08 Measure the signal to noise ratio of a receiver.
01.09 Conduct operating system checks of AM transmitters and receivers.
01.10 Analyze AM radio circuits.
01.11 Measure AM signals using appropriate test equipment.
01.12 Design, analyze, troubleshoot and adjust AM hetrodyning, frequency synthesis, phase-locked-loop, filtering and automatic control circuits.
01.13 Analyze, troubleshoot and adjust RF power amplifier circuits.
01.14 Describe the operation of Double Side Band (DSB) and Single Side Band (SSB) radio systems.
01.15 Identify the stages of SSB and DSB transmitter and receiver circuits.
01.16 Design, analyze and troubleshoot SSB and DSB transmitter and receiver circuits.
01.17 Conduct operating system checks and make minor adjustments to SSB and DSB transmitters and receivers.
01.18 Analyze and test AM, SSB and DSB radio circuits using spectrum analyzers, noise analyzers, impedance meters, sweep generators, distortion meters and power meters.

02.0 DEMONSTRATE PROFICIENCY IN DESIGN AND ANALYSIS OF FM TRANSMITTERS AND RECEIVERS--The student will be able to:

02.01 Describe the operation of FM radio systems.
02.02 Identify the stages of FM transmitter and receiver systems.
02.03 Describe the principles of operation of frequency modulation.
02.04 Design, analyze and troubleshoot FM transmitter and receiver circuits.
02.05 Align and measure the bandwidth of IF amplifier circuits.
02.06 Measure the receiver input sensitivity.
02.07 Conduct an operating systeme check of FM transmitters and receivers.
02.08 Design, analyze, adjust and troubleshoot FM stereo transmitter and receiver circuits.
02.09 Design, analyze, adjust and troubleshoot digital tuning circuits.
02.10 Design, analyze, adjust and troubleshoot phase modulation (PM) circuits.
02.11 Design, analyze, adjust and troubleshoot FM transceiver circuits.
02.12 Test, adjust and align FM and PM transmitters and receivers using the spectrum analyzer, sweep generator, noise analyzer,

frequency meter, modulation meter, impedance bridge and power meter.
02.13 Analyze, adjust and troubleshoot heterodyning, frequency synthesis, phase-locked loop, signal filtering and automatic control circuits as applied to FM and PM systems.

03.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF TRANSMISSION LINE SYSTEMS AND ANTENNAS--The student will be able to:

03.01 Analyze and describe the concepts required to evaluate and measure the characteristics of transmission lines.
03.02 Analyze and describe the cause and effect of standing waves on transmission lines.
03.03 Calculate transmission line characteristics using a Smith chart.
03.04 Analyze and demonstrate the use of waveguide components as transmission lines.
03.05 Analyze and describe the concepts of radio wave propagation.
03.06 Analyze the theoretical concepts which define antenna equivalent circuits and couplers.
03.07 Analyze the characteristics of radiation fields.
03.08 Perform and analyze the calculations required to evaluate the effectiveness of antennas.
03.09 Set up and adjust antenna systems using a power meter and SWR meter.

04.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF FIBER-OPTIC SYSTEMS--The student will be able to:

04.01 Analyze and demonstrate the operation of light emitters and receivers including the LED, photoconductive cells photodiode and phototransistors.
04.02 Analyze and demonstrate the application of optical electronic devices in power control circuits and in analog, digital and data communication circuits.
04.03 Splice fiber cables.
04.04 Test and evaluate optical modulators and demodulators.
04.05 Analyze and demonstrate multiplex transmission using full and half duplex communications via a fiber-optic system.

05.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF DIGITAL COMMUNICATION SYSTEMS--The student will be able to:

05.01 Describe the operation of the main parts of a telephone.
05.02 Analyze and evaluate the operation of programmable digital filters.
05.03 Describe the operation and application of compression amplifiers.
05.04 Analyze and demonstrate the operation of compander circuits.
05.05 Describe, analyze and demonstrate the operation of a sample and hold circuit.
05.06 Describe the conversion of analog signals into a digital format.
05.07 Analyze and evaluate the operation of analog to frequency and frequency to analog conversion circuits.
05.08 Describe the general characteristics of a telephone subscriber loop.
05.09 Describe, demonstrate and analyze the operation of tone dialing, DTMF (Dual Tone Multi Frequency), pulse dialing and ringing circuits.
05.10 Analyze and evaluate the operation of IC voice circuits and microphones.
05.11 Describe, evaluate and analyze the operation of a modulator/demodulator (MODEM) in the originate and answer mode.

05.12 Describe the various functions of a BORSCHT (Battery Overload Ring Supervision Coding Hybrid Test) circuit.
05.13 Describe, evaluate and analyze the operation of a subscriber line interface circuit (SLIC).
05.14 Describe and analyze the operation of pulse code modulation (PCM) circuits.
05.15 Describe, analyze and evaluate the operation of a coder/decoder (CODEC) IC circuit.
05.16 Describe, analyze and evaluate the operation of a continuously variable slope delta modulation circuit.
05.17 Describe, evaluate and analyze the operation of a time-slot assignment circuit (TSAC).
05.18 Describe and evaluate the application of fiber optic systems to telecommunications.
05.19 Analyze and describe applications of speech synthesis and recognition circuits to telecommunications.

06.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF DATA COMMUNICATIONS--The student will be able to:

06.01 Describe the layers of a communications system as they apply to message protocol.
06.02 Describe the protocal requirements necessary to insure the transmission of a data message.
06.03 Describe, from a system standpoint, the characteristics of the RS-232 standard.
06.04 Analyze and troubleshoot communications between a computer and a terminal and between two computers.
06.05 Compare the RS-232 standard with other communication standards (serial and parallel).
06.06 Describe, analyze, troubleshoot and demonstrate the operation of an asynchronous modem.
06.07 Utilize special purpose data system test equipment.
06.08 Identify the limitations of a telephone circuit on a data communications system.
06.09 Describe star, bus and ring topologies as applied to data networks.
06.10 Design, connect and troubleshoot a Local Area Network (LAN).
06.11 Describe the operation of a cellular communications network.
06.12 Analyze the network design criteria necessary to eliminate or reduce noise interference.
06.13 Describe and analyze error detection and correction methods used in data communication systems.
06.14 Describe basic data encryption and decryption methods.

07.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF SATELLITE COMMUNICATION SYSTEMS--The student will be able to:

07.01 Describe the fundamental concepts of satellite communications.
07.02 Analyze tracking antenna control systems.
07.03 Analyze low noise amplifiers.
07.04 Analyze satellite receiver systems.
07.05 Analyze and demonstrate the operation of facsimile recorders for weather patterns.
07.06 Operate amateur radio satellite communication systems.
07.07 Operate multiplexed data telemetry systems.
07.08 Plot the locations of orbiting satellites.
07.09 Operate recording systems to record data from orbiting and geostationary satellites.

08.0 DEMONSTRATE PROFICIENCY IN THE ANALYSIS OF VIDEO SYSTEMS--The student will be able to:

08.01 Describe the fundamental concepts of Television Systems.
08.02 Analyze and describe the operation of the various sections of a TV transmitter.
08.03 Analyze and describe the characteristics of the television signal.
08.04 Describe and analyze the operation of the various sections of a TV receiver.
08.05 Describe the principles of color TV.
08.06 Describe the principles of High Definition TV (HDTV).
08.07 Compare the design differences and similarities between a TV receiver and a computer monitor.
08.08 Analyze the design of a monochrome computer monitor.
08.09 Analyze the design of a color computer monitor.
08.10 Compare the design of a low resolution and a high resolution computer monitor.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Television Production Operations

CODE NUMBER: Secondary _______ Postsecondary I100104

Florida CIP 0610.010400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ____7-9 ____9-12 _x_ Postsecondary Adult Vocational

______ Postsecondary Vocational _x_ Other 30,31

CERTIFICATION COVERAGE: ¶TEC ELEC @ 7 G TV PRO TEC @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a television production operator, television broadcast technician (34028242), video recording engineer (194.362-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and preparation to assume responsibility for overall production of television studio activities including scripts, lighting, filming and directing, electronic news gathering, and field production.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in camera principles, audio and video control, lighting methods, control room operation, station operation, and set preparation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0, Reading 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum

content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of the television production technology program instructional system, safety procedures and trade terminology.
02. Plan a set for television production.
03. Perform lighting activities for a planned production.
04. Operate studio color television camera.
05. Perform video tape recording and editing operations.
06. Perform television production and programming activities.
07. Perform character generator and special effects generator functions.
08. Operate television studio audio control system.
09. Perform electronic news gathering (ENG) and electronic field production (EFP) equipment functions.
10. Perform basic film operations.
11. Perform routine operator preventative maintenance operations.
12. Demonstrate appropriate communication skills.
13. Demonstrate appropriate math skills.
14. Demonstrate appropriate understanding of basic science
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Television Production Operations POSTSECONDARY NUMBER: I100104

01.0 DEMONSTRATE KNOWLEDGE OF THE TELEVISION PRODUCTION TECHNOLOGY PROGRAM INSTRUCTIONAL SYSTEM, SAFETY PROCEDURES AND TRADE TERMINOLOGY--The student will be able to:

01.01 Describe the operating system of the vocational program.
01.02 State and apply general safety rules for operation of equipment and learning activities in the lab.
01.03 Utilize trade terminology in the television production lab.
01.04 Utilize trade abbreviations and acronyms as appropriate.
01.05 Transport equipment safely and securely.
01.06 Store equipment in appropriate locations.

02.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

02.01 Prepare television set for a planned production.
02.02 Draw and design a set plan to scale.
02.03 Select and arrange stage props.
02.04 Utilize hand tools to construct scene components.
02.05 Inspect and repair scenery as needed.

03.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

03.01 Describe types of lighting fixtures.
03.02 Identify parts of lighting fixtures.
03.03 Perform special-effects lighting.
03.04 Set-up appropriate lighting for a production.
03.05 Describe functions of master lighting panel and dimmer board.
03.06 Operate master lighting panel to dimmer board.
03.07 Analyze lighting needs for production.

04.0 OPERATE STUDIO COLOR TELEVISION CAMERA--The student will be able to:

04.01 Describe major parts of a studio camera.
04.02 Align camera for a studio production.
04.03 Perform appropriate camera movements.
04.04 Operate camera for commercial recording.
04.05 Operate camera for studio production.
04.06 Perform floor director's functions.

05.0 PERFORM VIDEO TAPE RECORDING AND EDITING OPERATIONS--The student will be able to:

05.01 Identify and describe different video tape machines.
05.02 Describe operational parts of a video tape machine.
05.03 Operate video tape machine to record and playback.
05.04 Describe operational parts of a video cassette editor.
05.05 Perform assemble edits.
05.06 Perform insert edits.
05.07 Set-up video tape machines.
05.08 Set-up video cassette editor.

06.0 PERFORM TELEVISION PRODUCTION AND PROGRAMMING ACTIVITIES--The student will be able to:

06.01 Operate master switcher.
06.02 Operate routing switcher for production and tape dubs.
06.03 Set-up machines and tuner for in-house playback.
06.04 Compute broadcast math.
06.05 Develop script for a program.
06.06 Draw story board for a planned production.
06.07 Direct participants in production of a program.
06.08 Perform on-camera.

07.0 PERFORM CHARACTER GENERATOR AND SPECIAL EFFECTS GENERATOR FUNCTIONS--The student will be able to:

07.01 Describe operational parts of character generator.
07.02 Set-up character generator.
07.03 Describe inputs of special effects generator.
07.04 Operate special effects generator during production.
07.05 Operate character generator during production.

08.0 OPERATE TELEVISION STUDIO AUDIO CONTROL SYSTEM--The student will be able to:

08.01 Identify and select microphones for production.
08.02 Place microphones for maximum effect.
08.03 Describe parts of cartridge machine.
08.04 Set-up cartridge machine for production.
08.05 Operate cartridge machine during recording and playback.
08.06 Describe parts of reel-to-reel tape machine.
08.07 Set-up reel-to-reel tape and cassette tape machines for production.
08.08 Operate reel-to-reel tape and cassette tape machines for production.
08.09 Describe parts of a turntable.
08.10 Operate turntable for production.
08.11 Describe parts a audio mixing console.
08.12 Operate audio mixing console.

09.0 PERFORM ELECTRONIC NEWS GATHERING (ENG) AND ELECTRONIC FIELD PRODUCTION (EFP) EQUIPMENT FUNCTIONS--The student will be able to:

09.01 Describe ENG and EFP port-a-pac components.
09.02 Set-up port-a-pac for field production.
09.03 Operate port-a-pac during production segments.

10.0 PERFORM BASIC FILM OPERATIONS--The student will be able to:

10.01 Operate film editor.
10.02 Edit film for time slot.
10.03 Describe parts of film island.
10.04 Set-up film island for production.

11.0 PERFORM ROUTINE OPERATOR PREVENTATIVE MAINTENANCE OPERATIONS--The student will be able to:

11.01 Describe types of video connectors.
11.02 Describe types of audio connectors.
11.03 Assemble audio and video cables.
11.04 Operate soldering equipment.
11.05 Clean tape heads on audio recording equipment.
11.06 Clean tape heads on video recording equipment.
11.07 Replace broken knobs.
11.08 Replace sliders and potentiometers.
11.09 Troubleshoot bad cable connection.

11.10 Replace headshell/cartridge and balance tone arm.
11.11 Adjust turntable speed as needed.
11.12 Solder ¼", RCA, miniature, and XLR connectors.
11.13 Strip cable for soldering.
11.14 Replace bulb in light fixture.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be

able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Theater and Entertainment Technology

CODE NUMBER: Secondary _______ Postsecondary ________

Florida CIP 0650.999901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

__x__Postsecondary Vocational _____ Other ________

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as theater and entertainment technicians (962.684-014), sound controllers (194.262-014), grips (962.687-022), dressers (346.674-010), prop makers (962.281-010), lighting equipment operators (962.381-014), high riggers (962.664-010), lighting technicians (962.362-014), stage hands (962.167-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, training in stage craft, theatrical lighting and sound, and equipment maintenance.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in stage lighting, sound, scenery construction, equipment maintenance and theatrical performance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Construct and install theatrical scenery to the specifications required in a scene design.
02. Perform the duties of a stage hand.
03. Install and operate theatrical sound equipment for performance.
04. Execute a "sound score" for theatrical productions.
05. Hang, focus and circuit stage lights to the specifications required in lighting designs.
06. Perform the duties of a light board operator and follow spot operator.
07. Maintain theater lighting and sound equipment.
08. Function as part of a technical team in planning, implementing, and running the technical aspects of theatrical/entertainment procedures.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: ___________

PROGRAM TITLE: Theater and Entertainment Technology

POSTSECONDARY NUMBER: _______

01.0 CONSTRUCT AND INSTALL THEATRICAL SCENERY TO THE SPECIFICATIONS REQUIRED IN A SCENE DESIGN--The student will be able to:

01.01 Use hand and power tools commonly found in theater scene shops.
01.02 Draft working drawings when given a ground plan and designer's elevations.
01.03 Choose the appropriate materials and hardware for scenic construction.
01.04 Construct common flat scenery used for theatrical purposes.
01.05 Construct common three-dimensional scenery used for theatrical purposes.
01.06 Demonstrate application techniques used in painting scenery.
01.07 Construct special effects commonly used in the theater.

02.0 PERFORM THE DUTIES OF A STAGE HAND--The student will be able to:

02.01 Operate equipment commonly found in theaters.
02.02 Determine methods for scenery repair within a limited time frame.
02.03 Assume crew chief responsibilities.
02.04 Perform all duties in a disciplined manner as required by the demands of performance.

03.0 INSTALL AND OPERATE THEATRICAL SOUND EQUIPMENT FOR PERFORMANCE--The student will be able to:

03.01 Identify sound equipment used in theatrical productions.
03.02 Assemble various components to develop a system.
03.03 Install a sound system resulting in optimal performance and safety of the equipment.
03.04 Operate sound equipment in record and playback mode.

04.0 EXECUTE A "SOUND SCORE" FOR THEATRICAL PRODUCTIONS--The student will be able to:

04.01 Select sound material.
04.02 Prepare, by recording and editing a sound tape for theatrical productions.
04.03 Operate components of sound systems as required for both reinforcement and effects applications.
04.04 Construct and operate mechanical electrical sound effects for productions.
04.05 Execute sound cues in performance.

05.0 HANG, FOCUS AND CIRCUIT STAGE LIGHTS TO THE SPECIFICATIONS REQUIRED IN LIGHTING DESIGNS--The student will be able to:

05.01Read a standard lighting plot.
05.02 Read a standard instrument schedule.
05.03 Identify stage lighting equipment.
05.04 Hang and circuit lights for a stage production.
05.05 Focus lights for a stage production.

06.0 PERFORM THE DUTIES OF A LIGHT BOARD OPERATOR AND FOLLOW SPOT OPERATOR--The student will be able to:

06.01 Make and read a lighting cue sheet.
06.02 Execute cues on a pre-set lighting board.
06.03 Program and execute cues on a memory lighting board.
06.04 Execute cues on a follow spot.

07.0 MAINTAIN THEATER LIGHTING AND SOUND EQUIPMENT--The student will be able to:

07.01 Calibrate and operate test equipment through all modes of operation as necessary for the maintenance of theater lighting and sound equipment.
07.02 Locate malfunctions in theater sound and lighting equipment using applicable diagnostic methods.
07.03 Read and understand technical manuals for theater lighting and sound equipment.

07.04 Update documentation so as to be aware of changes in manufacturer's product.
07.05 Record service records on equipment for the purpose of documenting manufacturer's warranties and maintaining a parts inventory.
07.06 Relate information about manufacturers and suppliers of theater lighting and sound equipment and supplies.

08.0 FUNCTION AS PART OF A TECHNICAL TEAM IN PLANNING, IMPLEMENTING AND RUNNING THE TECHNICAL ASPECTS OF THEATRICAL/ENTERTAINMENT PRODUCTIONS--The student will be able to:

08.01 Perform as a member of a technical team within the framework of an organized theater production.
08.02 Schedule job assignments in order to meet production deadlines.
08.03 Apply accepted principles of theater technology to a production situation(s).
08.04 Adapt learned skills and generate new approaches in order to solve unique production problems.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK

FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Industrial

EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Tile Setting

CODE NUMBER: Secondary ______ Postsecondary I460103

Florida CIP 0646.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__ Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 30,31

CERTIFICATION COVERAGE: ¶TEC CONSTR @ 7 G ¶BLDG CONST @ 7 G TILE SET @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as hard tile setters (87308551), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, proper care and use of hand tools and equipment, tile setting materials, basic blueprint reading, trade math and estimating materials for tile setting.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in adhesives, bedding materials, clay wall applications, masonry bed application, layout, setting, cutting, and grouting of ceramic tile.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific

program or course articulation agreements with each other. This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare walls for drywall application of ceramic tile.
02. Prepare walls using wire lathe, scratch coat and screeded coat for wet wall application of ceramic tile.
03. Apply tile and grout utilizing drywall techniques.
04. Apply tile and grout utilizing wet wall techniques.
05. Layout, cut and install ceramic tile on walls and floors, plumb, level, and with straight joints.
06. Interpret blueprints and estimate materials for tile work.
07. Proportion and mix mortar for tile installation.
08. Demonstrate appropriate communication skills.
09. Demonstrate appropriate math skills.
10. Demonstrate appropriate understanding of basic science.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education

SECONDARY NUMBER: ____________

PROGRAM TITLE: Tile Setting

POSTSECONDARY NUMBER: I460103

01.0 PREPARE WALLS FOR DRYWALL APPLICATION OF CERAMIC TILE--The student will be able to:

01.01 Determine readiness of subsurface for tile installation.
01.02 Repair damaged drywall.
01.03 Sand and finish drywall for application of tile.

02.0 PREPARE WALLS USING WIRE LATH, SCRATCH COAT AND SCREEDED COAT FOR WET WALL APPLICATION OF CERAMIC TILE--The student will be able to:

02.01 Install screed mud over concrete slab to install shower floor.
02.02 Measure and cut metal lath to size for walls and ceilings with tin snips.
02.03 Tack lath to wall and ceiling surfaces with staple gun or hammer.
02.04 Spread plaster base over lath with trowel and level plaster to specified thickness, using screed.
02.05 Spread concrete on subfloor with trowel and level it with screed.
02.06 Remove and replace existing backing materials in wet area.

03.0 APPLY TILE AND GROUT UTILIZING DRYWALL TECHNIQUES--The student will be able to:

03.01 Set tile on drywall with thinset.
03.02 Set tile using mastic adhesives.
03.03 Position tile and tap it with trowel handle to affix tile to plaster or adhesive.
03.04 Install tile over wire mesh and concrete masonry units.
03.05 Install tile over wood counter top.
03.06 Install counter top backsplash designs.
03.07 Layout counter top and backsplash designs.
03.08 Grout counter top and backsplash.
03.09 Grout floor tile.

04.0 APPLY TILE AND GROUT UTILIZING WET WALL TECHNIQUES--The student will be able to:

04.01 Grout tile on walls and floors.
04.02 Install tile floor over concrete slab using thinset.
04.03 Replace grout.
04.04 Grout wet area installation.
04.05 Install tile in shower stall.
04.06 Lay out shower.
04.07 Build a shower curb.
04.08 Prepare shower floor for tile installation.
04.09 Install wire mesh mortar units in a shower.
04.10 Install wire mesh mortar units in a tub surround.

05.0 LAYOUT, CUT AND INSTALL CERAMIC TILE ON WALLS AND FLOORS, PLUMB, LEVEL, AND WITH STRAIGHT JOINTS--The student will be able to:

05.01 Select and use tile setting tools.
05.02 Use tile nippers to nip different types of tile.
05.03 Cut and shape tile with tile cutters and biters.
05.04 Cut different types of tile with tile hand cutters.
05.05 Cut tile with rod saw.
05.06 Use a level.

05.07 Use electric drill.
05.08 Use tile saw.
05.09 Use tile cutter.
05.10 Cut tile with electric saw.
05.11 Clean tools and maintain in working order.
05.12 Smooth cut tile edges with grinding stone.
05.13 Select and use measurement tools.
05.14 Install tile plumb and level using level.
05.15 Square tile layouts using a steel square.
05.16 Maintain true and correct tile work with square.
05.17 Maintain clean, neat, and safe work area.
05.18 Practice personal and general job safety procedures of tile setters.
05.19 Miter base tile to fit angles.
05.20 Miter cap tile to fit angles.
05.21 Draw level starting and field lines, and level curbs and door jambs using a level.
05.22 Lay down working, finish, plumb, and level lines using a chalk line.
05.23 Butt tile rows using straightedge on starting line.
05.24 Figure layout.
05.25 Measure, cut, and install metal lath for shower pan.
05.26 Chisel tile and setting related substances.
05.27 Lay out tile setting jobs.
05.28 Lay out floor.
05.29 Install tile over previously poured interior concrete floor.
05.30 Install tile over wood floor.
05.31 Install ceramic tile over existing floor covering.
05.32 Install tile over existing tile.
05.33 Install tile floor over wood floor using mastic adhesive.
05.34 Install floor tile over wire mesh mortar units.
05.35 Install tile on exterior floor.
05.36 Install ceramic tile over laminated counter top and backsplash.
05.37 Install ceramic tile over ceramic tile on tub surround
05.38 Install marble window sills.
05.39 Install tile window sills.
05.40 Install a complete shower floor.
05.41 Clean aged tile.
05.42 Replace loose or damaged tile.
05.43 Measure and cut marble window sills.
05.44 Remove and replace shower floor and base.
05.45 Install fixtures.

06.0 INTERPRET BLUEPRINTS AND ESTIMATE MATERIALS FOR TILE WORK--The student will be able to:

06.01 Apply basic math skills to tile setting.
06.02 Measure floors, and walls using steel measuring tapes.
06.03 Measure tile cuts using wood folding rule.
06.04 Figure total tile amounts needed for job.
06.05 Estimate how many square feet of tile needed for bathroom walls.
06.06 Estimate how many square feet of tile needed for floor areas.
06.07 Calculate costs.
06.08 Maintain records of materials used.
06.09 Read blueprints and specification sheets that apply to tile setting.
06.10 Examine blueprints, measure and mark surfaces to be covered and lay out work.
06.11 Prepare list of supplies and tools needed to complete a job.

07.0 PROPORTION AND MIX MORTAR FOR TILE INSTALLATION--The student will be able to:

07.01 Mix setting materials manually with hand tools and equipment.
07.02 Mix setting materials with a power mixer.
07.03 Follow safety practices when mixing setting materials.
07.04 Follow manufacturers directions.
07.05 Select and mix adhesives to set tile.
07.06 Determine quantity and type of setting materials needed.
07.07 Proportion setting materials ingredients for specific uses.

08.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Tractor and Trailer Body Repair and Refinishing

CODE NUMBER: Secondary _______ Postsecondary I470613

Florida CIP 0647.060301

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS x

APPLICABLE LEVEL(S): ___7-9 ___9-12 x Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 30,31

CERTIFICATION COVERAGE: AUTO BODY @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as an automotive body related repairman (85305631), truck body builder (807.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the repair of bodies, fenders, and chassis of tractors and trailers.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in welding, sheetmetal work, plastic and fiberglass repair, painting, detailing, and frame straightening and repair on tractors and trailers.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of shop procedures.
02. Demonstrate use, care and maintenance of hand tools and power tools.
03. Align frames and suspension components.
04. Perform sheetmetal, wood, and aluminum frame, body, and chassis repairs on trailers.
05. Replace and repair fiberglass and plastic body components.
06. Replace window glass.
07. Rebuild and prime body panels.
08. Apply finish coats to prepared panels.
09. Demonstrate welding skills.
10. Perform detail work.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Tractor and Trailer Body Repair and Refinishing POSTSECONDARY NUMBER: I470613

01.0 DEMONSTRATE UNDERSTANDING OF SHOP PROCEDURES--The student will be able to:

01.01 Apply school and shop policies and procedures.
01.02 Apply shop safety rules and procedures.
01.03 Apply personal safety rules and procedures.
01.04 Apply electrical safety rules and procedures.
01.05 Apply fire safety rules and procedures.

02.0 DEMONSTRATE USE, CARE, AND MAINTENANCE OF HAND TOOLS AND POWER TOOLS--The student will be able to:

02.01 Identify, use, and show proper care and maintenance for the various hand tools employed by a body repair and refinishing technician.
02.02 Identify, use, and show proper care and maintenance for the various power tools employed by a body repair and refinishing technician.
02.03 Identify, use, and show proper care and maintenance for the various shop equipment employed by a body repair and refinishing technician.

03.0 ALIGN FRAMES AND SUSPENSION COMPONENTS--The student will be able to:

03.01 Diagnose and measure frame damage using self-centering, tram, and datum line gauges.
03.02 Straighten and align mash, sag, sideways, twist, kickup, broadside, and diamond frame damage.
03.03 Remove and replace damaged frame horns, side rails, cross members, front or rear frame sections; weld cracks in frame members.
03.04 Clean, prime, and protective-coat repaired frame areas.
03.05 Repair, reinforce, or replace weakened frame members in accordance with manufacturers' recommendations.

04.0 PERFORM SHEETMETAL,WOOD, AND ALUMINUM FRAME, BODY, AND CHASSIS REPAIRS ON TRAILERS--The student will be able to:

04.01 Remove and replace a bolted panel on panel assembly.
04.02 Remove and replace a welded sheetmetal panel or panel assembly.
04.03 Remove folds, curves, creases, and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions.
04.04 Weld cracked or torn sheet steel body panels. Reweld broken welds.
04.05 Weld cracked or torn aluminum body panels. Reweld broken welds.
04.06 Cut out damaged sections of sheet steel body panels and weld in replacements.
04.07 Cut out damaged sections of aluminum body panels and weld in replacements.
04.08 Heat shrink stretched panel areas back to contour.
04.09 Cold shrink stretched panel areas back to contour.
04.10 Recheck panel contour and alignment after shaping and correct or adjust as necessary.
04.11 Braze body panels only in locations recommended by manufacturer.
04.12 Straighten roughed-out contours of damaged panel to a surface

condition for bodyfilling or metal finishing.

05.0 REPLACE AND REPAIR FIBERGLASS AND PLASTIC BODY COMPONENTS--The student will be able to:

05.01 Repair deep gauges and cracks in fiberglass panels.
05.02 Repair holes in fiberglass panels.
05.03 Replace fiberglass body panels and straighten or align panel supports.
05.04 Remove damaged areas from fiberglass panels. Repair with partial panel installation.
05.05 Identify the type of plastic to be repaired and the appropriate repair procedure (including hot air welding, chemical bonding, and the use of structural adhesives).
05.06 Prepare the surface of thermoplastic parts and repair damage.
05.07 Prepare the surface of thermosetting plastic parts and repair damage.

06.0 REPLACE WINDOW GLASS--The student will be able to:

06.01 Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls.
06.02 Diagnose and repair water leaks, dust leaks, and wind noises.
06.03 Inspect, repair, and replace weather stripping.
06.04 Inspect, remove, and replace all stationary glass (including windshields, backlights, etc.), using manufacturers' recommended installation materials and procedures.

07.0 REBUILD AND PRIME BODY PANELS--The student will be able to:

07.01 Determine the extent of the direct and indirect damage, the direction of impact, and plan the methods and order of repair.
07.02 Straighten and align cowl assembly.
07.03 Straighten and align roof pillars and roof panels.
07.04 Straighten and align door posts.
07.05 Straighten and align door sills, floor pan, and rocker panels.
07.06 Straighten and align quarter panels, wheel house assemblies, and rear body sections.
07.07 Remove and replace hood, hood hinges, and hood latch.
07.08 Remove and replace doors and hinges.
07.09 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware.
07.10 Check and adjust hood clearances to adjoining panels.
07.11 Check door hinge condition; check door frames for square;check and adjust door clearances (where adjustable) along quarter panel, door, rocker panel, fender, and top.
07.12 Check and adjust bumper clearances to adjacent body and filler.
07.13 Repair or replace door skins and intrusion beams.
07.14 Restore protective coatings and sealants.
07.15 Grind the paint from the damaged area of a body panel to eliminate surface irregularities.
07.16 Pick and file the damaged area of a body panel to eliminate surface irregularities
07.17 Disc sand the repaired body panel to produce final smoothness.
07.18 Mix plastic filler.
07.19 Apply plastic body filler and cheese grate during curing.
07.20 Round sand cured plastic body panel for solder filling.
07.21 Clean and file surface of body panel for solder filling.
07.22 Apply and paddle body solder.
07.23 Grind and file body solder to contour and finish sand.
07.24 Neutralize the thinning agent acid.

08.0 APPLY FINISH COATS TO PREPARED PANELS--The student will be able to:

08.01 Use primers and sealers.
08.02 Clean surface for refinishing.
08.03 Sand painted surfaces.
08.04 Perform masking techniques.
08.05 Mix and tint paint.
08.06 Strip damaged finish.
08.07 Detail and touch up finished job.
08.08 Apply acrylic lacquer top coat.
08.09 Apply acrylic enamel top coat.
08.10 Apply polyurethane top coat.
08.11 Apply alkyd enamel top coat.
08.12 Apply stripes and decals.
08.13 Perform spot paint repair.

09.0 DEMONSTRATE WELDING SKILLS--The student will be able to:

09.01 Set up and operate oxyacetylene equipment.
09.02 Construct a butt and lap joint weld.
09.03 Braze a lap joint weld (horizontal position).
09.04 Set up and operate shielded metal arc welding equipment.
09.05 Set up and operate gas metal arc welding station.
09.06 Weld straight bead pattern.

10.0 PERFORM DETAIL WORK--The student will be able to:

10.01 Perform cleaning and restoring of interior areas.
10.02 Perform cleaning and restoring of exterior areas.
10.03 Perform cleaning and restoring of engine compartment.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes,

chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Upholstery and Furniture Refinishing

CODE NUMBER: Secondary _______   Postsecondary I480303

Florida CIP 0648.030300

SECONDARY SCHOOL CREDITS ______   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ____7-9 ____9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational   __x__ Other __30, 31__

CERTIFICATION COVERAGE: FURN REPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as furniture upholsterers, upholstery shop helpers (89508698), (780.687-054), upholstery installers (915.687-010), sewing machine operators (780.682-010), fabric layout and cutters (781.384-010), cushion construction or upholsterers (780.684-042), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; installation, repair, arrangement, and securing springs, filler, padding, and covering material and cutting, sewing and trimming upholstered items.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of power sewing machines, cushion stuffers, foam cutters, foam grinders, spray guns, band saws, belt sanders, drills and drill presses, portable power hand tools, air staple guns and hand tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course

must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Use trade skills.
02. Maintain and operate power machines.
03. Use upholstery skills.
04. Perform management skills.
05. Make and use patterns.
06. Build foundations.
07. Construct cushions.
08. Touch-up wood finish.
09. Demonstrate appropriate communication skills.
10. Demonstrate appropriate math skills.
11. Demonstrate appropriate understanding of basic science.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Upholstery and Furniture Refinishing POSTSECONDARY NUMBER: I480303

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 Use upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.
01.05 Clean shop.
01.06 Use appropriate fabric and thread.
01.07 Estimate fabric needed for final cover.
01.08 Mark pattern on fabric.
01.09 Cut out marked fabric

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Strip furniture down to frame.
03.02 Repair frame.
03.03 Construct decorative items.
03.04 Reconstruct deck with coil springs.
03.05 Reconstruct deck with zig-zag springs.
03.06 Reconstruct deck with rubber webbing.
03.07 Cover inside arms and/or wings.
03.08 Construct standard back.
03.09 Construct a loose pillow back.
03.10 Construct a barrel back.
03.11 Construct a mock diamond-tufted back.
03.12 Construct a diamond-tufted back.
03.13 Construct an attached pillow/bag back
03.14 Construct a channel back.
03.15 Cover outside arms and/or wings.
03.16 Cover outside back.
03.17 Construct a ruffled skirt.
03.18 Construct a pleated skirt.
03.19 Construct a lined-tailored skirt.
03.20 Attach cambric.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

04.01 Estimate cost and completion time.
04.02 Complete a work order.
04.03 Perform shop foreman duties.
04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

05.01 Estimate fabric needed for final cover.

05.02 Mark pattern on fabric.
05.03 Cut out marked fabric.

06.0 BUILD FOUNDATIONS--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.
06.05 Respring a sofa.
06.06 Respring a chair.

07.0 CONSTRUCT CUSHIONS--The student will be able to:

07.01 Construct a box cushion cover.
07.02 Construct a "T" cushion cover.
07.03 Construct a knife edge cushion cover.
07.04 Construct a pleated cushion cover.
07.05 Construct a cushion cover with inside springs.
07.06 Construct an attached cushion seat cover.

08.0 TOUCH UP WOOD FINISH--The student will be able to:

08.01 Repair scratches in wood finish.
08.02 Repair holes in wood finish.

09.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03 Read and follow written and oral instructions.
09.04 Answer and ask questions coherently and concisely.
09.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06 Demonstrate appropriate telephone/communication skills.

10.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

10.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
10.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
10.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
10.05 Demonstrate an understanding of federal, state and local taxes and their computation.

11.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

11.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
11.02 Draw conclusions or make inferences from data.
11.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

11.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.
12.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Vending and Recreational Machine Repair

CODE NUMBER: Secondary _______ Postsecondary I470109

Florida CIP 0647.010900

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS _x_

APPLICABLE LEVEL(S): ___7-9 ___9-12 _x_Postsecondary Adult Vocational

___ Postsecondary Vocational _x_Other 30,31

CERTIFICATION COVERAGE: ELECTRONIC @ 7 G APPLI REPR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a coin and vending machine servicer, repairer (85947642), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, machine assembly, installation service and repair of vending and recreational machines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in troubleshooting defective equipment, basic plumbing, refrigeration, electrical/electronics, machine refinishing, moving and set-up, sanitation, and recordkeeping.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Select and use tools and equipment.
02. Read and interpret blueprints and schematics.
03. Perform basic soldering.
04. Move and set up vending machines.
05. Load and operate machines.
06. Troubleshoot and repair coin mechanisms.
07. Perform minor maintenance and repair of machines.
08. Demonstrate appropriate sanitation practices.
09. Perform basic electrical/electronic repairs.
10. Perform piping and plumbing repairs.
11. Perform refrigeration system repairs.
12. Perform major machine maintenance.
13. Repair and refinish metal.
14. Maintain records and meet sanitation standards.
15. Demonstrate appropriate communication skills.
16. Demonstrate appropriate math skills.
17. Demonstrate appropriate understanding of basic science.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Vending and Recreational Machine Repair

EFFECTIVE DATE: July, 1993

SECONDARY NUMBER: ________

POSTSECONDARY NUMBER: I470109

01.0 SELECT AND USE TOOLS AND EQUIPMENT--The student will be able to:

01.01 Identify hand tools.
01.02 Utilize measuring tools.
01.03 Select and use basic shop equipment.
01.04 Operate and maintain welding equipment.
01.05 Operate water testing equipment.

02.0 READ AND INTERPRET BLUE PRINTS AND SCHEMATICS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication.
02.04 Develop shop drawings.
02.05 Trace out color coded circuits.
02.06 Prepare pictorial drawings for circuits.
02.07 Prepare exploded views circuits.
02.08 Take dimensions off drawings.

03.0 PERFORM BASIC SOLDERING--The student will be able to:

03.01 Employ safe shop practices.
03.02 Identify joints, positions and metal thickness.
03.03 Weld plates in flat position.
03.04 Weld square edge bolt, 3/16" plate, filed 3/16", in vertical position.
03.05 Lab weld 3/16" plate in vertical position.
03.06 Fillet weld ¼" plate in vertical position.
03.07 Lap weld ¼" plate in vertical position.
03.08 Butt weld 3/16" plate in horizontal position.
03.09 Butt weld ¼" plate in horizontal position.
03.10 Butt weld 3/16" plate (top level plate) in horizontal position.
03.11 Butt weld 3/16" plate in overhead position.
03.12 Lap weld 3/16" plate in overhead position.
03.13 Butt weld ¼" plate in overhead position.

04.0 MOVE AND SET UP VENDING MACHINES--The student will be able to:

04.01 Apply state vehicle code as applied to automatic vending machines.
04.02 Practice defensive driving.
04.03 Demonstrate knowledge of private property regulations.
04.04 Demonstrate knowledge of company regulations.
04.05 Maintain vehicle of transport.
04.06 Load vehicle to insure product care and product separation.
04.07 Maintain vehicle and product cleanliness.

05.0 LOAD AND OPERATE MACHINES--The student will be able to:

05.01 Load dispensing machines.
05.02 Test operation of machine following loading.

06.0 TROUBLESHOOT AND REPAIR COIN MECHANISMS--The student will be able to:

06.01 Disconnect and reassemble national rejector.
06.02 Disconnect and reassemble coin acceptor.
06.03 Disassemble and reassemble coin changers.
06.04 Trouble shoot wiring assembly.
06.05 Test changer for operation.
06.06 Apply and maintain steppers and accumulators.

07.0 PERFORM MINOR MAINTENANCE AND REPAIR OF MACHINES--The student will be able to:

07.01 Identify food vending machines by type through age dating.
07.02 Conduct preventative maintenance in food vending machines.
07.03 Identify cup dispensing variances in beverage machines.
07.04 Trouble shoot refrigeration devices in beverage dispensing machines.
07.05 Evaluate liquid pumping and drawing in beverage dispensing machines.
07.06 Identify external/internal assembly of beverage dispensing machine.
07.07 Replace pressurized gas containers.

08.0 DEMONSTRATE APPROPRIATE SANITATION PRACTICES--The student will be able to:

08.01 Demonstrate knowledge of NAMA public health regulations.
08.02 Demonstrate knowledge of NAMA equipment compliance code.
08.03 Demonstrate knowledge of University of Indiana test labs.
08.04 Demonstrate knowledge of role of health department inspectors.
08.05 Demonstrate knowledge of food handling procedures.
08.06 Evaluate food handling and storage based on transportation, temperature and time.
08.07 Conduct daily/weekly sanitation procedures on machines.
08.08 Conduct monthly preventative sanitary procedures on machines.
08.09 Conduct general field sanitation based on machine location, exterior construction and maintenance.
08.10 Evaluate water supply and disposal facilities.
08.11 Conduct inspection of sanitary delivery of product.
08.12 Evaluate shop and commissary sanitation.

09.0 PERFORM BASIC ELECTRICAL/ELECTRONIC REPAIRS--The student will be able to:

09.01 Apply basic electrical safety practices.
09.02 Identify the nature of electricity
09.03 Apply OHMS law.
09.04 Identify magnetism
09.05 Identify electrical components symbols and diagrams.
09.06 Apply basic electrical theory and calculations.
09.07 Calculate and measure electrical valves in series and parallel circuits.
09.08 Compare alternating-to direct-current.
09.09 Test electrical components.
09.10 Test single and three phase motors.
09.11 Test capacitors and rectifiers.
09.12 Test solid state components.
09.13 Design electrical systems.
09.14 Test coils, relays and solenoids.
09.15 Describe electrodes applications.

10.0 PERFORM PIPING AND PLUMBING REPAIRS--The student will be able to:

10.01 Demonstrate basic plumbing skills.

10.02 Braze aluminum tubing.
10.03 Bend copper tubing.
10.04 Braze weld copper tubing.
10.05 Cut steel pipe.
10.06 Cut PVC pipe.
10.07 Flare copper tubing.
10.08 Flare copper tubing.
10.09 Braze two metal jobs.
10.10 Assemble specialized fillings.
10.11 Install pipe.
10.12 Secure pipe to various surfaces.
10.13 Install water pipes.
10.14 Pressure test water system.
10.15 Connect machine plumbing to water supply.
10.16 Install drainage for machine as appropriate.

11.0 PERFORM REFRIGERATION SYSTEM REPAIRS--The student will be able to:

11.01 Apply principles of thermodynamics to vending refrigeration.
11.02 Apply HEAT ENTHALPY chart BTU/lb.
11.03 Apply principles of latent heat, effective heat, super heat.
11.04 Apply principles of Boyles Law and Charles Law.
11.05 Apply principles in changes in state of matter.
11.06 Apply principles of conduction/convection heat.
11.07 Define function of refrigeration components: compressors, controls evaporators, condensors, accession driers, filters, defrost, by-pass.
11.08 Trouble shoot the system by:
  a. Identifying the problem.
  b. Determining proper solution, time, cost, and parts availability.
  c. Making repairs.
  d. Testing.
11.09 Describe construction and function of hermetic compressor.
11.10 Describe construction and function of evaporator post.
11.11 Describe construction and function of condensors-static and depromic.
11.12 Describe construction and function of minor components.
11.13 Test and exchange refrigeration units.

12.0 PERFORM MAJOR MACHINE MAINTENANCE--The student will be able to:

12.01 Repair food vending machines by:
  a. Identifying machine through age dating.
  b. Identifying and clearing coin mechanism.
  c. Repairing/replacing parts.
  d. Checking for preventative maintenance.
12.02 Repair beverage vending machine by:
  a. Identifying cup dispensing variances in hot and cold machines.
  b. Trouble shooting refrigeration devices.
  c. Evaluating liquid principles through pumping and draining.
  d. Checking external/internal assembly.
  e. Checking coin mechanism.
  f. Refinishing damaged surface.
12.03 Repair recreational machine by:
  a. Assessing nature of problems.
  b. Assessing coin mechanism.
  c. Repairing/replacing parts.
  d. Finishing metal/wood surfaces.
  e. Testing for operation.

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13.0 REPAIR AND REFINISH METAL--The student will be able to:

13.01 Use primers and sealers.
13.02 Clean surface for refinishing.
13.03 Sand painted surface.
13.04 Strip damaged surface.
13.05 Fill depressed area with fillers.
13.06 Apply corrosion-control materials.
13.07 Select paints as appropriate.
13.08 Apply paint or polish as appropriate.

14.0 MAINTAIN RECORDS AND MEET SANITATION STANDARDS--The student will be able to:

14.01 Maintain service records.
14.02 Complete and file service call records.
14.03 Be familiar with the practice governing health codes.
14.04 Comply with state and county health code standards.
14.05 Demonstrate practice of personnel health.
14.06 Use water test equipment.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

15.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
15.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills.

16.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

16.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
16.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
16.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
16.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
16.05 Demonstrate an understanding of federal, state and local taxes and their computation.

17.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

17.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
17.02 Draw conclusions or make inferences from data.
17.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
17.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make appropriate job changes.
18.09 Demonstrate acceptable employee health habits.
18.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

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CURRICULUM FRAMEWORK

FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Industrial

EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Welding

CODE NUMBER: Secondary ______ Postsecondary I480508

Florida CIP 0648.050800

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __x__

APPLICABLE LEVEL(S): ___7-9 ___9-12 __x__Postsecondary Adult Vocational

______ Postsecondary Vocational __x__Other __30, 31__

CERTIFICATION COVERAGE: WELDING @ 7 G METAL WORK @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welders and cutters (93914881), combination welders (819.384-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of blueprints and shop drawing, use gases and/or welding processes and braze parts according to diagrams, blueprints or written specifications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in various processes and techniques of welding and fabrication skills, including oxyacetylene welding and cutting (OAW), brazing, arc welding (SMAW), MIG welding (GMAW), TIG welding (GTAW), certification test preparation, and use of current industry standards, practices, and techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline

committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.
This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643. F.S.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic shop skills.
02. Read blueprints.
03. Identify metals.
04. Apply gas welding skills.
05. Apply shielded metal arc welding skills (SMAW).
06. Apply gas tungsten arc welding skills (GTAW), (GMAW), (FCAW).
07. Apply gas metal arc welding (GMAW) and flux core arc welding (FCAW) skills.
08. Apply plasma arc skills.
09. Fabricate and weld pipe joints.
10. Perform combination welding skills.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial

SECONDARY NUMBER: ________

PROGRAM TITLE: Welding

POSTSECONDARY NUMBER: I480508

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply communications and leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

02.0 READ BLUEPRINTS--The student will be able:

02.01 Interpret welding symbols.
02.02 Interpret detail drawings.
02.03 List materials for fabrication from blueprint.
02.04 Develop shop drawings.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify metals by spark test.
03.03 Classify metals by magnetic properties.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Identify safety and set-up procedures.
04.02 Set up oxy-fuel equipment.
04.03 Cut carbon steel using oxy-fuel equipment.
04.04 Run beads with gas welding equipment.
04.05 Gas weld carbon steel joints.
04.06 Braze ferrous and non ferrous metals.
04.07 Form metals with gas equipment.
04.08 Remove distortion using gas equipment.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Identify safety and set-up procedures.
05.02 Identify and select proper electrodes.
05.03 Set up SMAW equipment.
05.04 Run beads with SMAW equipment.
05.05 Apply surfacing skills.
05.06 Weld single pass and multiple pass lap joints in all positions.
05.07 Weld outside corner joints in all positions.
05.08 Weld multiple pass "tee" joints in all positions.
05.09 Weld but joints in all positions.
05.10 Weld and bend test coupons.
05.11 Cut with SMAW equipment.

06.0 APPLY GAS TUNGSTEN ARC WELDING SKILLS (GTAW)--The student will be able to:

06.01 Identify safety and set-up procedures.
06.02 Assemble and set-up GTAW equipment (TIG).

06.03 Run beads with GTAW equipment.
06.04 Weld aluminum joints with GTAW equipment.
06.05 Weld mild steel joints with GTAW equipment.
06.06 Weld stainless steel joints with GTAW equipment.

07.0 APPLY GAS METAL ARC WELDING SKILLS (GMAW) AND FLUX CORE ARC WELDING (FCAW) SKILLS--The student will be able to:

07.01 Identify safety and set-up procedures.
07.02 Assemble and set-up GMAW equipment.
07.03 Run beads with GMAW equipment (MIG).
07.04 Weld mild steel joints with GMAW equipment.
07.05 Weld aluminum joints with CMAW equipment.
07.06 Weld with flux core equipment (FCAW).

08.0 APPLY PLASMA ARC SKILLS--The student will be able to:

08.01 Identify safety and set up procedures.
08.02 Assemble and set up plasma arc equipment.
08.03 Cut with plasma arc equipment.

09.0 FABRICATE AND WELD PIPE JOINTS--The student will be able to:

09.01 Prepare pipe joints for welding.
09.02 Set up and weld pipe joints.

10.0 PERFORM COMBINATION WELDING SKILLS--The student will be able to:

10.01 Repair products of ferrous and non-ferrous metals.
10.02 Fabricate products of ferrous and non-ferrous metals.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes,

chemical reaction, and moisture content.
13.02 Draw conclusions or make inferences from data.
13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Welding Technology

CODE NUMBER: Secondary _______ Postsecondary _______

Florida CIP 0615.061000

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS __x__ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

__x__ Postsecondary Vocational _____ Other

CERTIFICATION COVERAGE:

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as a welding technician (011.261-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of blueprints and shop drawings use of gases and/or welding processes, and brazing parts according to diagrams, blueprints or written specifications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in various processes and techniques of welding and fabrication skills, including oxyacetylene welding and cutting (OAW), brazing, arc welding (SMAW), MIG welding (GMAW), TIG welding (GTAW), certification test preparation, and use of current industry standards, practices, and techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The typical length of this program for the average achieving student is an Associate Degree.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Apply basic shop skills.
02. Read blueprints.
03. Identify metals.
04. Apply gas welding skills.
05. Apply shielded metal arc welding skills (SMAW).
06. Apply gas tungsten arc welding skills (GTAW), (GMAW), (FCAW).
07. Apply gas metal arc welding (GMAW) and flux core arc welding (FCAW) skills.
08. Apply plasma arc skills.
09. Fabricate and weld pipe joints.
10. Perform combination welding skills.
11. Demonstrate appropriate communication skills.
12. Demonstrate appropriate math skills.
13. Demonstrate appropriate understanding of basic science.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Welding Technology POSTSECONDARY NUMBER:

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply communications and leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

02. READ BLUEPRINTS--The student will be able to:

02.01 Interpret welding symbols.
02.02 Interpret detail drawings.
02.03 List materials for fabrication from blueprint.
02.04 Develop shop drawings.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify metals by spark test.
03.03 Classify metals by magnetic properties.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Identify safety and set-up procedures.
04.02 Set-up oxy-fuel equipment.
04.03 Cut carbon steel using oxy-fuel equipment.
04.04 Run beads with gas welding equipment.
04.05 Gas weld carbon steel joints.
04.06 Braze ferrous and non ferrous metals.
04.07 Form metals with gas equipment.
04.08 Remove distortion using gas equipment.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Identify safety and set-up procedures.
05.02 Identify and select proper electrodes.
05.03 Set-up SMAW equipment.
05.04 Run beads with SMAW equipment.
05.05 Apply surfacing skills.
05.06 Weld single pass and multiple pass lap joints in all positions.
05.07 Weld outside corner joints in all positions.
05.08 Weld multiple pass "tee" joints in all positions.
05.09 Weld butt joints in all positions.
05.10 Weld and bend test coupons.
05.11 Cut with SMAW equipment.

06.0 APPLY GAS TUNGSTEN ARC WELDING SKILLS (GTAW)--The student will be able to:

06.01 Identify safety and set-up procedures.
06.02 Assemble and set-up GTAW equipment (TIG).
06.03 Run beads with GTAW equipment.

06.04 Weld aluminum joints with GTAW equipment.
06.05 Weld mild steel joints with GTAW equipment.
06.06 Weld stainless steel joints with GTAW equipment.

07.0 APPLY GAS METAL ARC WELDING SKILLS (GMAW) AND FLUX CORE ARC WELDING (FCAW) SKILLS--The student will be able to:

07.01 Identify safety and set-up procedures.
07.02 Assemble and set-up GMAW equipment.
07.03 Run beads with GMAW equipment (MIG).
07.04 Weld mild steel joints with GMAW equipment.
07.05 Weld aluminum joints with GMAW equipment.
07.06 Weld with flux core equipment (FCAW).

08.0 APPLY PLASMA ARC SKILLS--The student will be able to:

08.01 Identify safety and set-up procedures.
08.02 Assemble and set-up plasma arc equipment.
08.03 Cut with plasma arc equipment.

09.0 FABRICATE AND WELD PIPE JOINTS--The student will be able to:

09.01 Prepare pipe joints for welding.
09.02 Set-up and weld pipe joints.

10.0 PERFORM COMBINATION WELDING SKILLS--The student will be able to:

10.01 Repair products of ferrous and non-ferrous metals.
10.02 Fabricate products of ferrous and non-ferrous metals.

11.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS -- The student will be able to:

11.01 Write logical and understandable statements, or phrases; accurately fill out forms/invoices commonly used in business and industry.
11.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
11.03 Read and follow written and oral instructions.
11.04 Answer and ask questions coherently and concisely.
11.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
11.06 Demonstrate appropriate telephone/communication skills.

12.0 DEMONSTRATE APPROPRIATE MATH SKILLS -- The student will be able to:

12.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
12.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
12.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
12.04 Determine the correct purchase price, including sales tax for a materials list containing a minimum of six items.
12.05 Demonstrate an understanding of federal, state and local taxes and their computation.

13.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE -- The student will be able to:

13.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

13.02 Draw conclusions or make inferences from data.

13.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.

13.04 Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.

14.02 Secure information about a job.

14.03 Identify documents which may be required when applying for a job interview.

14.04 Correctly complete a job application form.

14.05 Demonstrate competence in job interview techniques.

14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.

14.07 Identify acceptable work habits.

14.08 Demonstrate knowledge of how to make job changes appropriately.

14.09 Demonstrate acceptable employee health habits.

14.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Chapter 442, F.S..

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.

15.02 Describe the importance of entrepreneurship to the American economy.

15.03 List the advantages and disadvantages of business ownership.

15.04 Identify the risks involved in ownership of a business.

15.05 Identify the necessary personal characteristics of a successful entrepreneur.

15.06 Identify the business skills needed to operate a small business efficiently and effectively.

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